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Evolutionary Sexual Psychology

Meskó Norbert

AKADÉMIAI DOKTORI ÉRTEKEZÉS

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Acknowledgement

This dissertation, like most, is formally submitted by a single individual, with only one name appearing on its cover. However, anyone unfamiliar with the nature of my scientific field might mistakenly believe that the work contained within these articles reflects the efforts of one person alone. In truth, nothing could be further from reality. Scientific psychology, as I practice it, is inherently a collaborative endeavor conducted within research groups alongside esteemed colleagues. It is, therefore, with deep gratitude that I acknowledge the invaluable contributions of my remarkable collaborators.

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1 | INTRODUCTION AND AIMS OF STUDIES

> "The most important of all causes of organic change is the variability of reproduction. Individuals who leave the most offspring will transmit their structure, instincts, and mental capacities in greater proportion to the succeeding generation. The struggle for existence, however, will be most severe between those closely related in habits and constitution, and which consequently come into closest competition." (Darwin, 1871 p. 86)

The psychological aspects of human mating have seldom been examined under laboratory conditions because of significant ethical constraints. However, a historical event that can be considered a naturalistic human mating experiment is the 1790 mutiny of the HMS Bounty. Following the mutiny, 27 individuals (nine British mutineers, 12 Tahitian women, and six Tahitian men) settled on Pitcairn Island. Their isolation led to violent male competition for sexual partners and control over alcohol reserves, resulting in numerous fatalities. The ensuing conflicts documented in contemporary accounts vividly illustrate the darker manifestations of psychological mechanisms underlying human motivation and behavior (Alexander, 2003; Shapiro, 1936; Young, 2022).

Examining human motivation through an evolutionary lens enables recognition of various motivational systems, including self-preservation, pathogen avoidance, social connection, social standing, partner seeking, relationship maintenance, and offspring care. Each of these systems uniquely shapes emotions, thoughts, and actions (Schaller et al., 2017). The evolutionary approach to human psychology is grounded in two fundamental principles from evolutionary and developmental biology: (1) the genetic makeup of current human populations is the result of a prolonged process of natural selection, and (2) the human nervous system typically develops in accordance with genetic instructions (Neuberg & Schaller, 2014). Considering these principles, "human nature" can be characterized as comprising the psychological mechanisms that exist because they promote genetic propagation throughout the evolutionary history of our species. These mechanisms were previously labeled instincts (e.g., James, 1890; McDougall, 1908), but are now referred to as motivational systems, which have been shaped by evolutionary processes to govern specific functional behaviors (Tooby et al., 2008).

In contrast to regulatory systems that manage metabolic processes (such as the immune system), motivational systems have been developed to govern behavioral interactions with the

environment and other organisms. The fundamental principle of the evolutionary perspective on motivation is functional modularity (Barrett & Kurzban, 2006; Tooby et al., 2008), which proposes that distinct psychological motivational systems emerge in response to the varying selection pressures associated with different reproductive challenges. For example, various types of close relationships (including alliances, sexual partnerships, and parent-child bonds) have differing impacts on reproductive fitness, requiring specific behavioral responses (Kenrick et al., 2013; Meskó & Őry, 2023). Supporting evidence generally aligns with the notion that separate motivational systems have evolved to regulate behavior in these domains. These systems are considered "modular" in a functional sense: they are sensitive to particular environmental signals that elicit specific affective, cognitive, and behavioral reactions.

The evolutionary approach to understanding motivation supplements other theories that emphasize individual objectives or requirements (e.g., Bernard et al., 2005; Fernald, 1992; Sadler, 2005). Motivational mechanisms have been developed to enhance genetic transmission rather than to directly promote personal well-being or contentment, although these may be secondary outcomes. The field of evolutionary biology places greater importance on comprehending the fundamental motivational systems that constitute human nature as opposed to focusing on subjectively valued results (Meskó, 2012, 2013, 2020).

Contemporary applications of these principles have uncovered various motivational systems that are likely to develop in response to specific evolutionary pressures on early human populations. These systems are functionally distinct, with each attuned to different categories of stimuli that trigger unique affective, cognitive, and behavioral responses (e.g., Schaller et al., 2017). Kenrick et al. (2010) modified Maslow's hierarchy of needs. Employing evolutionary reasoning and Plutchik's (1980) "psychoevolutionary" approach to human emotions, their revised pyramid conceptually depicts separate and hierarchically arranged motivational systems that evolved to address different challenges related to reproduction.

The updated hierarchical model (depicted in Figure 1) outlines separate categories of human motivation but does not identify specific motivational mechanisms within each category, particularly at the lower levels. Various systems govern the fulfillment of basic physical needs (such as nourishment, hydration, and temperature regulation) and self-preservation. Support for these distinctions comes from research showing different emotional reactions associated with various "core" motivational systems (Beall & Tracy, 2017). For example, threats from predators and infectious diseases trigger fear and disgust, respectively, leading to distinct behavioral responses (Neuberg et al., 2011). Within close relationships, separate motivational systems are also connected to specific emotional responses such as sexual excitement during mating and

affection during parenting (Barnard et al., 2007). Factor analyses of self-reported motivational inclinations further validated these distinctions and indicated additional subtle functional differences (Neel et al., 2016).

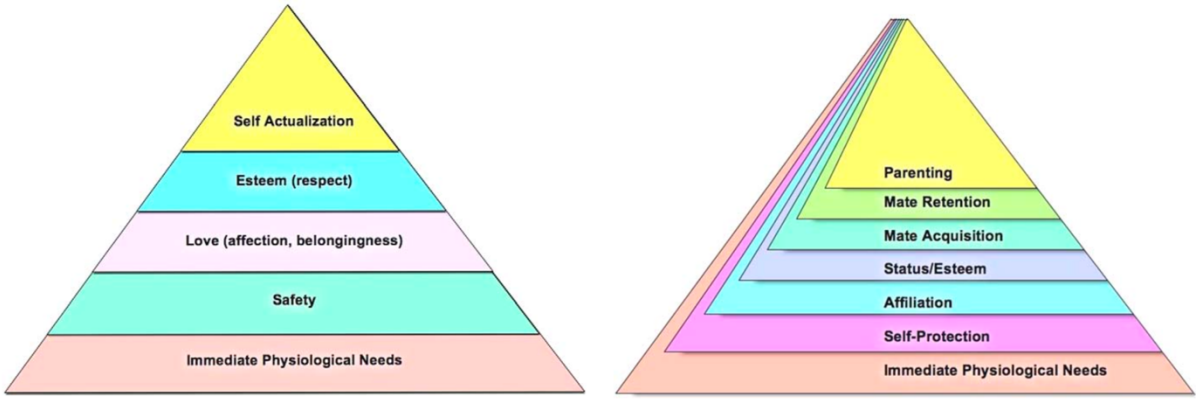


Figure 1. *On the left, the classic Maslow hierarchy of needs is depicted as a pyramid. An updated hierarchy of fundamental human motives is shown on the right-hand side. This figure integrates concepts from life history development with Maslow's original framework, incorporating reproductive goals in the sequence that are likely to emerge developmentally. The model illustrates that later-developing goal systems overlap with rather than entirely replace earlier systems. Once a goal system is established, it is activated in response to relevant environmental cues. (Source: Kenrick et al., 2010)*

The updated hierarchy proposed by Kenrick et al. (2010) incorporates developmental priorities based on the Life History Theory (LHT; MacDonald, 1997). LHT explains how organisms adaptively distribute bioenergetic resources in response to challenges presented by their ecological and developmental environments (Del Giudice, 2019; Del Giudice et al., 2015). In infancy, early motivational systems have emerged to regulate behaviors that secure resources for basic physiological needs. As individuals grow, systems address additional reproductive challenges. For instance, in children, self-protection responses develop before concerns regarding social relationships arise.

The apex of the pyramid diverges from Maslow's framework, which is influenced by reproductive fitness principles. As individuals enter adolescence, securing a mate becomes the primary focus, and later transitions to sustaining relationships and nurturing offspring for those who reproduce. These motivational systems remain highly accessible throughout life, enabling swift reaction to pertinent challenges and opportunities. This evolutionary viewpoint elucidates how motivational systems, despite their hierarchical structures, enable flexible adaptation to ongoing reproductive challenges. This adaptability is achieved by integrating new motivations over time while preserving earlier drives, allowing for lifelong adjustments to changing circumstances.

These sophisticated motivational mechanisms, which are integral to the psychological makeup of typically developing humans, help elucidate the nebulous concept of "human nature"

while also accounting for variations among individuals (Figueredo et al., 2006; Fraley & Roberts, 2005). Life History Theory (LHT) offers a methodological foundation for anticipating and comprehending many individual variances (Buss, 1984, 2001, 2009).

A fundamental principle of the LHT is that both time and energy are finite resources. Consequently, when these resources are devoted to developing or implementing a specific regulatory system, they become unavailable for other systems, resulting in an unavoidable compromise (Figure 2). The management of these compromises, specifically the decision-making process regarding which systems are adaptively prioritized, fluctuates in a predictable manner based on reproductive demographics, including sex and age.

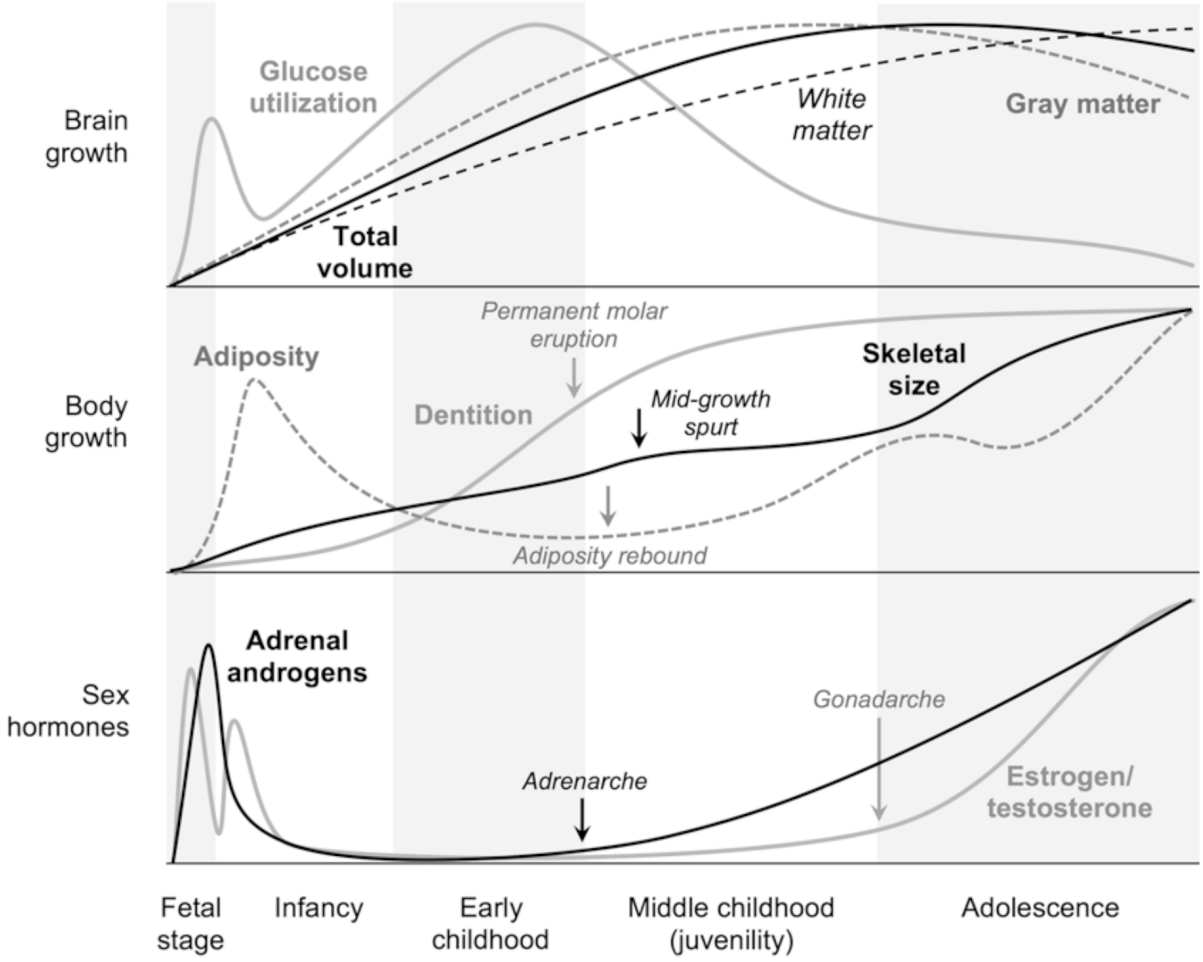


Figure 2. *Developmental trajectories of human growth and sex hormones production, from conception to adolescence. Arrows show the landmark events that characterize middle childhood (Source: Del Giudice et al., 2015).*

Sex-based differences are explored in greater depth below (specifically in relation to mating motivations); further implications are associated with characteristics unique to particular "life phases." For example, it is anticipated that young adults who have reached reproductive maturity but have not yet had children will dedicate considerable resources to motivational systems governing mating behavior (Conroy-Beam et al., 2019a,b). As individuals progress into

later adulthood, they are more likely to have children (who require protection and care to eventually reproduce), thus shifting resources from mating to parenting systems (Neel et al., 2016). Research findings support the notion that mating system activation reaches its peak in early adulthood and diminishes as adults grow older and/or become parents, whereas the parenting system becomes more readily activated in older adults and/or those with children (Buckels et al., 2015).

LHT also predicts the motivational consequences of individual differences in early childhood ecology (Figure 3). For example, individuals developing in unpredictable environments with relatively reduced life expectancies are more likely to exhibit an accelerated trajectory towards reproduction ("fast" life history strategy), characterized by a greater focus on immediate rewards and increased resource allocation to mating efforts (Del Giudice, 2020; Del Giudice, & Belsky, 2011; Sear, 2020; Yang et al., 2022). Consistent with this general pattern, individuals from less stable environments have stronger mating motives (Griskevicius et al., 2011; Hurst & Kavanagh, 2017).

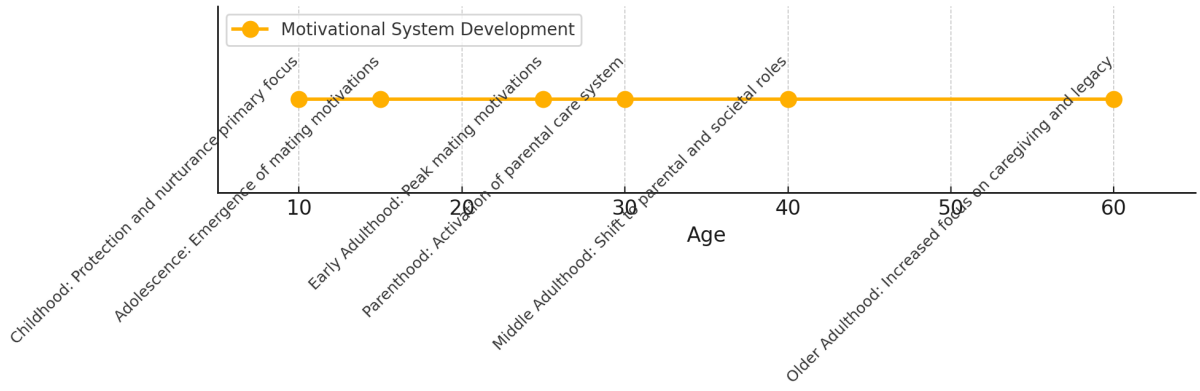


Figure 3. *Developmental trajectories of motivational systems across the lifespan. The timeline illustrates key transitions in motivational priorities, from childhood protection and nurturance, through the peak of mating motivations in early adulthood, to the activation of parental care systems and the focus on caregiving and societal roles in later life. (Source: Own illustration)*

Various factors, such as specific genetic predispositions or learning experiences, can contribute to individual variation in fundamental motivational systems. These personal differences, regardless of their source, significantly influence social cognition and behavior. The following sections provide examples that illustrate motivational systems in the realms of disease avoidance, mating, and parenting.

Individuals vary in their chronic susceptibility to diseases caused by parasites (Duncan, et al., 2009; Navarrete & Fessler, 2006). Research shows that, even when accounting for other avoidance tendencies, those with a stronger motivation to avoid infection display more pronounced prejudice towards groups perceived as potential infection risks, such as foreigners and

people with unusual physical characteristics (e.g., deformities, disabilities, or obesity; Oaten, et al., 2011). Historical data indicate that numerous cultural norms function as protective measures against the transmission of infectious diseases (Park et al., 2003). Individuals with heightened disease avoidance tendencies exhibit more conformist attitudes, stricter moral judgments regarding deviation from traditional norms—particularly those related to "purity"—and are more inclined to express conservative sociopolitical views (Kusche & Barker, 2019; Schaller et al., 2022).

In the realm of mating, some fundamental motivational disparities are linked to gender. These differences align with the evolutionary principles. Throughout history, distinct factors have shaped the reproductive potential of both males and females, resulting in unique mating motivations (Meskó, 2010, 2021). Females tend to be more attuned to indicators of social standing, access to resources, and physical protection. In contrast, males are generally more responsive to signs of youthfulness and reproductive capacity (Buss, 1989; Bleske & Buss, 2000; Geary, 1999; Shuster, 2009).

Due to the greater physiological investment in reproduction by females, particularly during pregnancy and nursing, women generally exhibit more selective and cautious behavior when encountering new mating prospects. By contrast, men typically demonstrate a greater inclination to actively pursue such opportunities (Buss & Schmitt, 2019; Conroy-Beam et al., 2015; Walter et al., 2020, 2021).

Variations exist not only between sexes, but also within them. Specifically, sociosexual orientation represents individual variance in preferences for committed versus casual mating approaches (Jackson & Kirkpatrick, 2007; Penke & Asendorpf, 2008). These distinctions affect visual focus (such as attentiveness to appealing members of the opposite sex; Duncan et al., 2007), partner preferences (for instance, the appeal of specific physical and personality traits in a mate; Simpson & Gangestad, 1992), romantic behaviors (like flirting; Penke & Asendorpf, 2008), and numerous other aspects of mating behavior (Simpson et al., 2004). Sociosexual orientation impacts not only reactions to potential partners, but also interactions with same-sex individuals viewed as romantic rivals. For instance, men with unrestricted sociosexuality tend to engage in direct competition with others (Simpson et al., 1999).

People, whether they have children or not, vary in how easily protective and nurturing instincts are triggered when they encounter young children. This variation is linked to the motivational system of parental care (Buckels et al., 2015). Those with a more sensitive system tend to react more positively to babies and adults with baby-like features while also being more critical of others who violate social norms (Neel et al., 2016). Individuals with a consistently

active parental care system also show a stronger inclination towards partners who exhibit kindness, loyalty, responsibility, and stability, traits that suggest an ability to provide long-term, shared parental care (Buckels et al., 2015). It is worth noting that research consistently demonstrates that individual differences in parental care motivation do not influence preferences for other generally desirable partner traits such as physical attractiveness. Instead, the effect is specifically related to characteristics that indicate effective coparenting abilities.

Environmental conditions are essential in triggering fundamental motivational systems. Although these systems may be available to individuals, their activation is contingent on their immediate social and ecological environment. Specific sensory cues and subsequent evaluations activate specific motivational systems. Once triggered, these systems govern responses to stimulating factors and shape overall reactions to the surroundings, encompassing social cognition and behavior in a broader context. In the following sections, representative examples of disease avoidance, mating, and parental care are presented.

Various stimuli can activate the disease avoidance system, including visible injuries, unpleasant organic smells, and knowledge of an approaching epidemic (Murray & Schaller, 2012). Once triggered, the system produces several psychological effects. When infectious disease threats become temporarily prominent, it results in increased prejudice towards individuals with unusual physical features and heightened xenophobia compared with control situations involving other types of threats (Schaller & Neuberg, 2012). Additionally, this system distinctly influences the manifestation of conformist attitudes, preferences for individuals who conform, and conformist behaviors (Wu & Chang, 2012). A wide range of studies have demonstrated the extensive cognitive and behavioral effects of temporarily activating the disease avoidance system (reviewed in Murray & Schaller, 2016).

Activation of mating motives can occur through exposure to an attractive potential partner or environmental signals, suggesting mating opportunities (Meskó & Őry, 2022; Meskó & Zsidó, 2022). Once triggered, these motives influence visual attention. Individuals who are heterosexual, especially those with an open sociosexual orientation, tend to focus more on attractive members of the opposite sex (Becker et al., 2005). This selective attention leads to biases in social perception and interpretation; for example, men misinterpret attractive women's facial expressions as signs of sexual interest (Maner et al., 2005). When the mating motive is temporarily activated in men, it results in behaviors aimed at setting themselves apart from competitors, including engaging in risky activities, nonconformities, creative pursuits, and conspicuous acts of altruism (Ronay & von Hippel, 2010).

Activation of mate retention and mate acquisition motives leads to distinct consequences (Birkás et al., 2018; Meskó et al., 2021). For example, when the mate retention motive is triggered, individuals tend to pay less visual attention to attractive members of the opposite sex (Maner et al., 2008), potentially reducing the chances of unfaithfulness. Additionally, this activation enhances focus on same-sex competitors and diminishes trust towards them (Neuberg et al., 2016).

People are attuned to indicators that suggest a need for nurturance and protection, such as facial features reminiscent of infants, including large eyes and small nose. These characteristics elicit emotional reactions linked to parental care, particularly feelings of tenderness (Kalawski, 2010). This response is not limited to parents; it can be experienced by individuals without children and can even be triggered by youths of other species or adults with childlike facial features (Sherman et al., 2013).

When triggered, parental care instincts shape attitudes and behaviors that are believed to enhance offspring survival in ancestral settings. People not only display nurturing responses but also become more cautious in their social interactions, including carefully controlled physical movements and risk-averse mindsets (Eibach & Mock, 2011). The temporary activation of this instinct also increases wariness towards perceived threats, such as unfamiliar individuals, potentially dangerous members of outgroups, and those who violate social norms (Gilead et al., 2014).

According to Life History Theory (LHT), adaptive resource allocation trade-offs play a crucial role in shaping individual developmental paths and behavioral strategies. A key trade-off exists between investing in mating and parental efforts (Del Giudice et al., 2015), implying that the motivational systems governing mating and parental care have mutually inhibitory relationships. This is observable on a developmental scale, where inclinations towards short-term mating show negative correlations with tendencies toward parental care (Beall & Schaller, 2014). Such inhibition can also manifest in short-term cognitive processes, where activating the mating system may temporarily suppress the parental care system and vice versa.

Comparable trade-offs in costs and benefits ensure reciprocal regulation among the various motivational systems. For example, engaging in sexual intercourse during reproduction increases the risk of exposure to infectious diseases. Consequently, activating the mating drive may suppress the disease-avoidance instinct, and the reverse is true. In line with this, sexual arousal diminishes disgust (Stevenson et al., 2011), while prominent infection risks decrease women's inclination towards short-term mating (Murray et al., 2013). Disease avoidance also conflicts with social affiliation: people who are focused on disease perceive themselves as less

sociable (Mortensen et al., 2010), whereas socially excluded individuals show less concern about disease (Sacco et al., 2014).

The interplay between motivational systems is characterized by reciprocal enhancement. For instance, securing high-status mates yields reproductive advantages, particularly for females (Conroy-Beam, 2019a). Thus, in environments that stimulate mating impulses, women typically prioritize social status indicators for potential male partners. Simultaneously, activation of mating motives in men often triggers status-seeking mechanisms. This is evidenced by competitive aggression, conspicuous displays of altruism, and consumption behaviors that signal elevated social standing (Griskevicius et al. 2009).

Human evolutionary processes have resulted in diverse psychological outcomes at the population level across different ecological environments, which are reflected in cultural variations (Gangestad et al., 2006; Sorokowska et al., 2023; Sorokowski et al., 2023). According to the Life History Theory (LHT), varying ecological conditions lead to different life history strategies, which are expressed through distinct patterns of fundamental motives. For instance, higher population density is linked to slower life history strategies in humans and other species (Sng et al., 2017). In terms of fundamental motives, a slower strategy is characterized by reduced investment in mating and an increased focus on mate retention and parental care. Additional ecological factors also influence motivational patterns: those that heighten a population's need for self-protection and status hierarchy are associated with greater male-to-female ratios and wider income disparities (Kenrick & Gómez-Jacinto, 2014).

To understand human nature from an evolutionary standpoint, one must consider human characteristics and behaviors in relation to the genetic imperative of reproduction (Dawkins, 1976). This genetic focus tends to overlook the distinctions between various physiological systems that control different bodily functions, including behavior. As a result, there is no clear separation between the motivational systems studied in psychology and the other sophisticated regulatory systems investigated by biomedical researchers (Tooby et al., 2008). Consequently, certain motivational systems may have functionally adaptive connections with other regulatory systems, which are typically not examined in psychological studies.

Research indicates that the psychological drive to avoid diseases can impact actual immune responses to infections, and this relationship works both ways (Schaller et al., 2010). These observations imply that the system motivating disease avoidance is a crucial component of the immune system and has evolved to shield organisms from infections (Clark & Fessler, 2014; Gangestad & Grebe, 2014). The evolutionary approach to understanding human

motivation provides a comprehensive theoretical framework that allows the integration of studies on human motivation with research on physiological processes.

In summary, the evolutionary perspective of human motivation provides a comprehensive framework for understanding the diverse and interrelated motivational systems that have evolved to address specific adaptive challenges. From self-preservation and pathogen avoidance to social connection, mating, and parenting, these systems operate in a dynamic interplay, reflecting trade-offs and synergies shaped by ecological and developmental contexts. Life History Theory enriches this understanding by highlighting resource allocation strategies that guide these systems across different life stages and environments. Importantly, the modular and flexible nature of these motivational systems allows individuals to navigate complex social and ecological landscapes, adapting to changing circumstances, while maintaining core evolutionary imperatives. By integrating insights from evolutionary biology and psychology, this framework offers a robust foundation for exploring the nuanced interplay between individual differences, environmental triggers, and behavioral outcomes. The following sections delve deeper into specific motivational systems using this theoretical grounding to examine their manifestations in contemporary human behavior.

***

This thesis explores the psychological aspects of human mating by investigating sexual motivation, attachment, sociosexuality, and relationship dynamics across different age groups, genders, and cultures, providing insights into how these factors shape sexual and relationship patterns. Exploration of the relationships between sexual motivation and other mating-related psychological functions may play an important role in a more comprehensive understanding of the psychological aspects of human sexuality. Investigating sexual motivation in an evolutionary framework can contribute to psychological research on human sexuality, including both intraindividual and interpersonal processes. This thesis focuses on three series of studies of the evolutionary psychology of sexuality: (1) individual differences in sexual motivation, (2) psychological correlates of openness to sugar relationships (one form of sexual relationship based on exchanges of sex for resources), and (3) women's faking orgasm. These topics are among the current challenges faced by both theorists and sexual psychology practitioners. Table 1 summarizes the topics and aims of this study.

Table 1 *Summary of the Studies Presented in the Thesis*

Chapter	Topic	Aim
2	**Individual differences in sexual motivation**	
2.1	Sex- and age-related associations of non-committed sociosexuality	Development and validation of the Hungarian version of the Sociosexual Orientation Inventory
2.2	Sex- and age-related associations of sexual motivations and their correlations with personality and sociosexuality	Development and validation of the Hungarian version of the Reasons for Having Sex Questionnaire
2.3	Sex- and age-related associations of sexual motivation, adult attachment, and sexual system functioning	Development and validation of the Brief Hungarian version of the Reasons for Having Sex Questionnaire
2.4	Sex and relationship differences in romantic love	Development and validation of the Hungarian version of the Short Love Attitude Scale
2.5	Sex differences in predictors of relationship satisfaction	Testing the effects of dyadic coping, romantic love, sexual motivation, and having children on subjective relationship satisfaction
2.6	Sex and age differences in sexual motivation	Testing sex- and age-specific patterns of associations of sexual motivation with emotion regulation and dyadic coping
2.7	Cross-cultural study of intrasexual competition	Testing cross-sectional links between mating competition, aggression, appearance enhancement, and sexuality in three countries
3	**Exchanges of sex for resources in human mating**	
3.1	Individual differences in attitudes towards sex-for-resources encounters among younger people	Development, validation and personality correlates of the Acceptance of Sugar Relationships in Young Women and Men Scale
3.2	Individual differences in attitudes towards sex-for-resources encounters among older people	Development, validation and personality correlates of the Acceptance of Sugar Relationships in Older Men and Women Scale
3.3	Differences between age groups in openness to sex-for-resources encounters	Testing the links between openness to sugar relationships, adult attachment, motivation, and self-esteem
3.4	Global study of exchanges of sex for resources across 87 countries	Exploring links between attitudes towards sugar relationships and individual-level and country-level variables
3.5	The impact of early childhood experiences on openness to sex-for-resources encounters	Exploring links between life history strategy and openness to sugar relationships
4	**Women's faking orgasm**	
4.1	Individual differences between self-reported faking orgasm, sexual motivation, and sexual working models	Development and validation of the Hungarian version and abridgement of the Faking Orgasm Scale for women
4.2	Individual differences between self-reported faking orgasm and adult attachment	Exploring links between dimensions of adult attachment and motivation for faking orgasm among women
4.3	Individual differences between self-reported faking orgasm and emotion regulation	Exploring links between women's faking orgasm, sexual motivation, and emotion regulation difficulties
4.4	Individual differences between faking orgasm, sociosexuality, relationship satisfaction, and mate retention	Exploring links between women's faking orgasm, sociosexuality, relationship satisfaction, and mate retention

1.1 Sexual Motivation

Despite substantial progress, defining sexual motivation remains challenging because of the lack of a universally accepted definition (Kleinginna & Kleinginna, 1981). Current theories and classifications often dominate scientific discourse in this area. Since understanding motivational processes is key to explaining human behavior, the study of sexual motivation is critical for gaining insights into human sexual behavior.

In sexology, disentangling the complex motivational factors of sexual desire is essential for understanding both the pathological behaviors and dynamics of different types of sexual relationships. Insights into sexual motivation also contribute to empirically grounded knowledge on why individuals form and maintain emotional and erotic connections. Historically, sexual desire has been conceptualized as an instinct or biological drive. While Sigmund Freud (1905) theorized the neurotic manifestations of its physiological components, considering sexuality as a basic need, such as hunger or thirst, more recent views recognize sexual desire as part of the sexual response cycle and as a subjective emotional experience (Kaplan, 1979; Fuertes, 1995). Early theories, such as those proposed by Marañón (1925) and Levine (1984) laid the groundwork for current conceptual models by identifying three key components of desire in general: vegetative, psychic, and expressive levels, or biological, motivational, and behavioral factors, respectively. Fuertes (1995) expanded this conceptualization by emphasizing the neurophysiological, emotional, and inductive elements involved in desire. Today, sexual desire is generally understood as a complex interplay among multiple components, and this approach makes any attempt at a precise definition elusive.

The emotional and motivational dimensions of sexual desire are critical for a comprehensive analysis of the phenomenon, necessitating further exploration to deepen the understanding. The term ‘sexual motivation’ has been frequently used in previous studies (Kaplan, 1995; Pfaus, 1999; Singer & Toates, 1987; Toates, 2009; Whalen, 1966), and while the terminology persists, conceptual clarification is wanting. In the context of the present thesis, what is commonly referred to as sexual motivation will be termed “erotic motivation,” which expresses a shift of focus towards gender-related differences as explored in sexology.

As Seto (2017) noted, sexual motivation extends beyond a basic biological instinct seeking gratification, influencing an individual’s perceptions, intentions, and psychological processes, although it remains distinct from these factors. Human sexuality serves various functions, ranging from pleasure seeking to self-expression and identity reinforcement (García & Díaz, 2011), and is characterized and shaped by significant variability both across and within

individuals. It is evident that sexual desire cannot be fully understood solely through a biological and reproductive lens. While these aspects are foundational, cognitive and emotional influences as well as contextual factors are also to be considered to capture the complexity of erotic desire. Despite the need for a complex approach, subjective sexual motivation—an individual's explicit, consciously accessible, or self-perceived reasons for engaging in sexual activity—has not been adequately addressed in literature on sexual motivation. Many theories have historically emphasized an inherent biological drive, as clearly articulated in the seminal works of Hill and Preston (1996) and Masters and Johnson (1966), who linked sexual response to a drive towards orgasm. Current theories continue to portray sexual motivation as a biological force shaped by factors such as hormones and nutritional deficits (Singer & Toates, 1987). While these theories account for biological factors, they often overlook the subjective motivations for engaging in sexual behavior or reduce them to simplistic inputs.

Several studies have explored a broad spectrum of subjective sexual motives. Nelson (1978) identified motives such as love, pleasure, conformity, recognition, and power, while Regan and Dreyer (1999) proposed categories including personal, social, environmental, and interpersonal factors. Despite the biological foundations of many contemporary theories, their authors generally acknowledge that conscious goals and incentives, such as reducing anxiety (Toates, 2009), are also critical. There is no universally accepted conceptual framework for subjective sexual motives; therefore, the proposed definitions and research methods are diverse. For instance, some researchers have identified only four primary sexual motives (Impett & Tolman, 2006), whereas others, such as Meston and Buss (2007), have documented up to 237 distinct reasons for engaging in sex. While some researchers have proposed intuitive classifications (e.g., love and affection; Nelson, 1978), others have employed theory-driven models (Cooper et al., 1998) and research methods (Meston & Buss, 2007).

Two major validated approaches exist for categorizing sexual motives. One includes heterogeneous theory-driven classifications based on the factor-analytically validated core motivational dimensions of human behavior. For example, Cooper et al. (1998) developed a scale that organizes motives along two axes: approach/avoidance, and individual/social. Approach motives pertain to engaging in sexual activity for positive outcomes, such as physical pleasure or intimacy, while avoidance motives aim to prevent negative outcomes, such as conflict or stress. These motives can be personal or social.

The second approach was data-driven, and the relevant instruments were based on generating a wide array of sexual motives and grouping them using exploratory factor analysis. Because this method is theoretical, categories are based on correlations between motives, resulting

in relatively homogeneous groupings. The YSEX? (Meston & Buss, 2007), which consists of 142 items, exemplifies this method.

Understanding sexual motivation is a complex endeavor that requires the navigation of diverse theoretical frameworks and empirical findings. Over the decades, researchers have debated the conceptualization of sexual desire, ranging from instinctual drives to intricate interplay of biological, emotional, cognitive, and social factors. While early approaches focused on biological imperatives, more recent perspectives have highlighted the subjective and multifaceted nature of sexual motivation, encompassing conscious goals, interpersonal dynamics, and cultural contexts. Existing models and classification systems, although insightful, often diverge in scope and methodology, creating challenges in capturing the full spectrum of sexual motives.

This chapter reviews foundational theories and recent advancements, emphasizing the diversity of approaches to categorizing sexual motivation and the limitations of current tools in measuring individual differences. It highlights the critical role of subjective motivations in shaping sexual behaviors, extending beyond biological imperatives to reflect broader psychological and relational processes. By synthesizing these insights, the groundwork is laid for a novel approach to exploring sexual motives in the Hungarian context.

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This thesis aims to construct and validate a comprehensive Hungarian questionnaire that examines individual differences in the underlying motivations for engaging in sexual intercourse. By capturing the multidimensional nature of sexual motives, this study seeks to provide a nuanced understanding of how these motivations vary across individuals and contexts. Furthermore, this study aims to elucidate the psychological correlates of sexual motivation, such as personality traits, attachment styles, emotional regulation, dyadic coping mechanisms, and intrasexual competition. Through this investigation, the research bridges theoretical models and empirical findings, contributing to a more integrative framework that accounts for both biological and sociocultural influences on sexual behavior. In doing so, it endeavors to enhance the precision of future studies and interventions in sexual psychology, offering a culturally specific yet universally applicable tool for advancing the understanding of human sexual motivation.

1.2 Exchanges of Sex for Resources in Human Mating

In non-human animals, sexual accessibility and resources are often exchanged in transactions between sexes (Kamimura et al., 2021; Lewis & South, 2012). These transactions typically show a distinct sex-based pattern: mating accessibility of individuals of one sex, the one which ensures the larger investment in the offspring (typically by female individuals), is an asset

sought for by individuals of the other sex (typically male individuals), which latter directly or indirectly provide resources in return for mating (Krebs & Davies, 1993; Petersen, 2022). In other words, sexual reproduction is an energy-demanding process that is carried out at the cost of transforming environmental resources into the required energy (Del Giudice et al., 2015; Noë & Hammerstein, 1994; Schowalter, 2022). Sexual transactions between females and males provide an adaptive form of energy sharing that has reproductive benefits for both sexes. Adapting transactional sexual behaviors to a specific niche is often crucial for a species to survive (Fisher & Pruitt, 2020).

For instance, male scorpionflies (*Bittacus apicalis*) feed their mates with insects they prey, while female scorpionflies invest their energy in growing eggs (Thornhill, 1976). Females are often willing to mate only with males whose prey meet a certain size. Similarly, monogamous female Adélie penguins (*Pygoscelis adeliae*) are willing to mate with males from other colonies in return for stones used to build nests during the mating period (Hunter & Davis, 1998). Reproductive success in a colony depends largely on the quality of the stone nest. Females and males of several primate species frequently engage in sexual transactions. Male pygmy chimpanzees (*Pan paniscus*) have been observed to offer food to females they previously mated with (de Waal, 1995), while male macaques (*Macaca fascicularis*), which have a lower status in the dominance hierarchy, need to spend more time grooming a female to gain sexual access than males with a higher status (Gumert, 2007).

Similar to non-human females, the biological conditions of reproduction require women to invest substantial energy in motherhood (for a review, see Savard et al. 2021). The social support that a mother receives during pregnancy, breastfeeding, and infant care contributes to the infant's chance of survival (Elsenbruch et al., 2007). Sexual transactions are also common in human societies (e.g., Ringdal, 2006). In return for a woman's sexual accessibility, a man can offer, for instance, love, commitment, respect, attention, physical protection, material benefits (e.g., expensive gifts, luxury travels, property), school grades, workplace promotions, or money (Baumeister & Vohs, 2004). According to the long-term mating scenario in a typical transaction, a man assumes long-term responsibility for providing resources to a woman in return for exclusive sexual access to her (Baumeister & Vohs, 2012).

Among the Kipsigis, a polygynous pastoral tribe in Kenya, a man who wants to marry, must pay an agreed price for the bride (Borgerhoff Mulder, 1990). In pre-industrial societies such as the Kipsigis, men's financial situation is a relatively reliable indicator of their reproductive success; that is, wealthier men have more children (Borgerhoff Mulder, 2000). This is primarily because they pay the highest price for the youngest physically fit women at the age

of peak fertility. Furthermore, wealthier men provide better food and health to their families, which is associated with shorter childbearing intervals and reduced infant mortality (White & Burton, 1988).

Among the Western Tanzanian Pimbwe, cultural norms allow both men and women to marry, divorce, and remarry relatively freely (Borgerhoff Mulder & Ross, 2019). It is worth noting that remarrying is more profitable for women than for men, that is, women frequently change partners to improve their financial situation. This behavior may be motivated by finding a better partner in terms of material resources, which is an adaptive response to the highly variable quality of the lands owned by Pimbwe (Borgerhoff Mulder, 2009), given that material resources play a crucial role in infant survival.

Different types of sexual transactions include short-term sexual relationships in which women's sexual accessibility and the material compensation offered by men are exchanged in unemotional business transactions (Burley & Symanski, 1981; Salmon, 2008; Symons, 1979). According to Sexual Strategies Theory (Buss & Schmitt, 1993, 2019), prostitution can also be interpreted as an extreme form of short-term mating strategy. From this point of view, men are sensitive to signals of women's immediate sexual availability, whereas women are sensitive to men's willingness to share their material resources directly (Meskó et al., 2021b).

1.2.1 Sugar Relationships

A contemporary form of modern transactional sex is sugar relationships, which are arranged via specialized dating websites using algorithms to match the demand and supply sides (Upadhyay, 2021). In 2006, Brandon Wade, an MIT graduate, launched SeekingArrangement.com to connect younger individuals advertising sexual availability (sugar babies/boys), with older individuals offering financial security (sugar daddies/mommies). This website has opened new avenues for those seeking sugar relationships. Currently, numerous websites that provide similar services operate globally. SeekingArrangement.com, the pioneer, is now used in 139 countries and boasts over 10 million active members, with approximately 20% being sugar daddies/mommies and 80% being sugar babies/boys (Seeking Arrangement, 2016).

In Hungary, the website Puncs.hu was launched in November 2016 by entrepreneur Péter Weiler (Hercsel & Németh, 2016), followed by Milliomosok.hu in 2021, founded by Renátó Bándli. These online dating platforms use modern marketing strategies to target potential users, akin to high-end luxury product manufacturers (e.g., Apple and Tesla). They emphasize that using their services allows clients to experience a desired lifestyle (Michman et al., 2003). This lifestyle is also promoted by reality TV shows such as "Feleségek luxuskivitelben," based on the American show Women in Luxury Design, which began in 2017 and has produced four

seasons so far. Thus, the widespread recognition and growing popularity of sugar relationships can be attributed to a well-orchestrated marketing campaign.

The concept of sugar relationships as business-oriented partnerships first garnered media attention about a decade ago, when a report highlighted college students using sugar daddies to pay tuition or repay student loans (Fairbanks, 2011). The initial mainstream media coverage described sugar culture by portraying wealthy men willing to pay for sex as "modern gentlemen" and young women engaging in sex for financial support as "ambitious Sugar Babies." From an economic perspective, Mixon (2019) argues that attending university is a form of human capital investment, with an increasing number of young women at expensive universities financing their education through income from sugar relationships, which he considers another form of human capital investment. This modern, marketing-infused version of transactional sex suggests a new term for paid sexual activity: "sugaring."

An increasing number of studies have addressed the involvement of female Western European university students in the sex industry to cover educational expenses (Ernst et al., 2021; Sagar et al., 2015; Simpson et al., 2021). Research on students' involvement in the sex industry indicates that economic considerations significantly influence their motivation to participate (Hakim, 2015; Sanders & Hardy, 2015).

The exchange of sex for resources, observed across both non-human and human species, highlights the deeply rooted interplay between biological imperatives and socioeconomic structures in shaping reproductive behaviors. By examining examples from scorpionflies to primates and extending them to human cultural practices, this section underscores how adaptive strategies for resource allocation and reproductive success manifest across contexts. The evolution of these exchanges from traditional mating systems to contemporary sugar relationships illustrates the ongoing negotiations between individual motivations and societal norms. Modern sugar relationships facilitated by digital platforms represent a complex intersection of economic considerations, relational dynamics, and cultural narratives. This discussion establishes the foundation for exploring individual differences in openness to such exchanges within the framework of human mating strategies. It provides a lens through which psychological and sociocultural factors can be systematically examined, bridging evolutionary principles with contemporary behavior.

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The overarching aim of this thesis is to develop a culturally tailored questionnaire that captures individual differences in openness to sugar relationships, a modern manifestation of transactional sex. This instrument seeks to identify and quantify the psychological, relational,

and sociocultural dimensions that underpin attitudes toward these exchanges. Beyond measurement, this research aims to investigate the psychological correlates of such openness, encompassing traits such as sociosexuality, love attitudes, the Dark Triad personality dimensions, and self-esteem. Furthermore, the role of developmental factors such as early childhood experiences and broader cultural influences will be explored to provide a holistic understanding of this phenomenon. By integrating evolutionary theories of mating strategies with contemporary psychological constructs, this study aims to illuminate the nuanced drivers behind openness to sugar relationships. The findings aim to contribute not only to the academic discourse on human mating behaviors, but also to practical applications in addressing the socio-psychological implications of transactional sexual dynamics in modern societies.

1.3 Women's Faking Orgasm

Women's faking orgasm has recently attracted scientific attention from clinical, social, evolutionary, and medical researchers, who are interested in understanding the motives for and other correlates of this phenomenon. Empirical findings indicate that almost two-thirds of women have pretended to reach orgasm at some point in their sex lives (Hite, 1976; Muehlenhard & Shippee, 2010). Despite its high prevalence, this behavior remains poorly understood and has not been the focus of much empirical research. It is one of the most under-studied aspects of human sexual behavior (Cooper et al., 2014). Although recent comprehensive reviews of female sexual function and behavior have covered various aspects of sexuality (e.g., Clayton & Hamilton, 2010; Graham, 2010; Mah & Binik, 2001; Meston et al., 2004), they have largely overlooked the subject of faking orgasm and its implications for sexual functioning and relationships. Scholars in this field have called for further research on how factors such as emotion regulation, sexual functioning, partner characteristics, and sexual history might influence a woman's decision to fake orgasm (Cooper, Conner, & Fauber, 2010; Kaighobadi, Shackelford, & Weekes-Shackelford, 2011; Muehlenhard & Shippee, 2010).

Most existing research on orgasm comes from Western countries (Armstrong et al., 2012; Herbenick et al., 2010; Pollet & Nettle, 2009; Swieczkowski & Walker, 1978; Tao & Brody, 2011). Findings suggest that orgasm achievement is more frequent in relationships than in casual sexual encounters among both men and women (Armstrong et al., 2012; Herbenick et al., 2019). Regarding heterosexual interactions, gender disparities in orgasm rates are evident, partly because of the emphasis on male pleasure, especially in casual sex scenarios (Frederick et al., 2018; Armstrong et al., 2012). Analyses of specific events reveal that a wider range of sexual activities, such as oral sex and manual stimulation, are linked to a higher likelihood of

orgasm in both genders (Herbenick et al., 2010). Qualitative studies have highlighted that for women, the ability to experience orgasm is often influenced by the emotional quality of interpersonal connections, sexual contact beyond intercourse, and positive body image (Fahs, 2014).

Research on the relationship between age and orgasm presents mixed results depending on the age group studied. Laumann et al. (2005) and Lindau et al. (2007) reported increased difficulty achieving orgasm in older age groups, specifically among those aged 40–80 and 57–85, respectively. Conversely, studies involving younger populations have reported different results. Herbenick et al. (2010) discovered that among individuals aged 18–59, aging and the likelihood of orgasm correlated positively among women but negatively among men. Kontula and Miettinen (2016) found that younger Finnish women (ages 18–24) were less likely to usually experience orgasm during lovemaking compared to their middle-aged and older counterparts. These findings suggest that the effects of age on orgasm may not follow a straightforward pattern. It has also been speculated that difficulties in achieving orgasm might lead to an increased likelihood of faking among younger (vs. older) women and older (vs. younger) men.

Relatively little is understood about the phenomenon of faking orgasm, which is defined as simulating a climax without experiencing it (Herbenick et al., 2019). Research indicates that faking orgasm is relatively common among women, with estimates suggesting that half to two-thirds of surveyed women tend to climax at some point in their sex lives (Braun et al., 2003; Cooper et al., 2014; Fahs, 2014; Muehlenhard & Shippee, 2010). Despite its high prevalence, empirical studies of the specific circumstances under which heterosexual women choose to fake or not to fake an orgasm remain limited, particularly outside Western contexts.

Fewer studies have explored the prevalence of and reasons for men's faking orgasm. It is commonly believed that due to biological factors, men would find it nearly impossible to fake orgasm. Braun et al. (2003) noted that a close association between male orgasm and ejaculation generally prevents men from pre-tending to climax. However, a mixed-methods study by Muehlenhard and Shippee (2010) found that 25% of men and 50% of women in their sample of 180 male and 101 female college students reported having faked an orgasm at least once. Among participants who had engaged in penile-vaginal intercourse, 28% of men and 67% of women had pretended to reach orgasm, highlighting a significant gender gap in this behavior (Frederick et al., 2018).

Research has identified three primary reasons why people in Western cultures might fake orgasm: first, to boost their partner's self-esteem (Fahs, 2014; Muehlenhard & Shippee, 2010); second, to avoid causing distress or disappointment to a partner (Mialon, 2012); and third, to end sexual activity, following the belief that sex is naturally concluded only when orgasm is

reached (Frith, 2015; Muehlenhard & Shippee, 2010). Further motivations include insecurity due to young age, falling out of love, feeling pressured to climax, experiencing difficulties due to past sexual trauma, or simply not knowing what an orgasm feels like (Herbenick et al., 2019).

Some studies employing mixed methods and qualitative approaches suggest that motivations for faking orgasm can differ by gender. Men often report faking orgasm when they feel they are unlikely to reach climax or if they think they are "taking too long," whereas women often fake to avoid negative consequences, such as hurting their partner's feelings (Muehlenhard & Shippee, 2010). For men, this behavior can be linked to pressures for performing masculinity in a broader context (Connell & Messerschmidt, 2005; Kimmel & Mahler, 2003). By contrast, women might fake orgasm to protect their partners' self-esteem (Herbenick et al., 2019) and conform to gendered expectations that encourage them to be deferential, appreciative, and considerate in sexual encounters (Frischherz & Rowe, 2023; Ford et al., 2023; Stelzl & Lafrance, 2021).

Faking an orgasm can also be understood as a strategy for managing social expectations during sexual interactions (Jackson & Scott, 2007). Despite the intimacy of sexual encounters, individuals often attempt to navigate social norms. Studies indicate that people generally strive to avoid awkwardness in sexual situations (Ford, 2021; Hirsch & Khan, 2020; Wade, 2017), behave in ways that align with their gender roles, and work to smooth any discomfort that may arise (Armstrong et al., 2006; Masters et al., 2013). Normative pressure can lead to deceptive behavior in both social and sexual contexts, such as pretending to climax to politely end an interaction. Research has shown that both men and women may engage in unwanted sex to avoid awkward situations (Hirsch & Khan, 2020; Muehlenhard et al., 2016; Thomas et al., 2017), suggesting that a faking orgasm might similarly serve to terminate an uncomfortable or unwanted sexual experience.

It is important to note that most people would probably prefer to experience an orgasm rather than a fake one. Faking typically occurs when an actual orgasm seems unattainable because of either the partner's behavior or circumstances (Bennett, 2023; Elmerstig et al., 2008; Wetzel et al., 2024). As discussed above, people may choose to fake either to prevent their partner from embarrassing or to bring the sexual encounter to an end.

Considering these findings, it is evident that factors predicting difficulty in achieving orgasm, such as lower physical satisfaction, may also predict a higher likelihood of faking orgasm. If faking is often an attempt to make the partner feel better or to avoid a negative reaction when an orgasm cannot be reached, predictors of the inability to reach orgasm are likely to be associated with faking orgasm. Additionally, indicators of concern for the partner's feelings may

correlate with both faking orgasm and a lower likelihood of experiencing it. Therefore, both real and faked orgasms may be linked to factors such as sexual inexperience, dissatisfaction with sexual experience, insecurity in the relationship, or concerns about how one's self is perceived by the partner.

Despite its high prevalence, the phenomenon of faking orgasm among women remains an understudied aspect of human sexual behavior. From an evolutionary perspective, this behavior may serve adaptive functions in the dynamics of human mating and reproductive strategies. Faking orgasm is a mechanism that influences mate retention, strengthens pair bonds, and manages relational dynamics under uncertain conditions (Buss & Shippee, 2010; Buss & Schmitt, 2019). Women may simulate orgasm to signal sexual satisfaction, thereby enhancing their partners' perceived mate value and reducing the risk of infidelity or relationship dissolution (Kaighobadi et al., 2012).

The evolutionary theory posits that reproductive fitness often depends on securing and maintaining access to high-quality mates. In long-term mating contexts, faking orgasm could function as a form of sexual signaling to reassure partners of their sexual adequacy, thus fostering relational stability (Fahs, 2014; Frederick et al., 2018). Such behavior aligns with women's evolved preferences for relational strategies that prioritize cooperation and emotional investment over direct confrontation or the risk of conflict (Conroy-Beam et al., 2015).

In addition to mate retention, faking orgasm may also reflect a strategy for navigating short-term mating dynamics. By simulating sexual satisfaction, women can expedite the conclusion of an encounter, particularly if the costs of disengagement are high. This behavior might minimize the risk of aggression or reputational damage in situations where direct refusal could be socially or personally costly (Stelzl & Lafrance, 2021; Wetzel et al., 2024).

Moreover, the act of faking orgasm may align with gendered sexual norms that emphasize women's responsibility for their partner's emotional well-being. Such norms likely emerged within the context of human pair bonding, where cooperative parenting and mutual investment are critical for offspring survival (Fisher 2013). By simulating sexual satisfaction, women can maintain harmony and cooperation within the dyad, ensuring continued investment from their partner (Buss & Schmitt, 2019).

The psychological mechanisms underlying this behavior may also be linked to the broader principles of life history theory. Women adopting slower life-history strategies, characterized by delayed reproduction and higher parental investment, may prioritize strategies that enhance long-term relational stability. Conversely, those with faster life-history strategies might use

faking orgasm more opportunistically to manage immediate social or sexual challenges (Ellis et al., 2009; Del Giudice et al., 2015).

Importantly, the evolutionary significance of faking an orgasm is not universally beneficial and may incur psychological costs. Repeatedly engaging in this behavior might lead to reduced sexual satisfaction, diminished authenticity within the relationship, and an unmet need for genuine intimacy (Fahs, 2014). These costs highlight the complex interplay between adaptive strategies and individual well-being in the context of evolved sexual behaviors.

By integrating insights from evolutionary psychology, this study sought to explore the multifaceted roles of faking orgasm in human mating systems. This study contributes to a broader understanding of how adaptive strategies are shaped by ecological, relational, and individual factors.

The phenomenon of a faking orgasm represents a fascinating intersection of individual psychological mechanisms, relational strategies, and broader evolutionary principles. As demonstrated in this section, this behavior serves various adaptive functions, ranging from enhancing pair bond stability to navigating the complex dynamics of both long-term and short-term mating contexts. It reflects a sophisticated interplay between sexual signaling, emotional regulation, and conformity to sociocultural norms that prioritize relational harmony and reproductive success. Understanding faking orgasm requires a nuanced approach that considers its role in mate retention, alignment with life history strategies, and potential psychological costs. By framing this behavior within evolutionary psychology, it is possible to uncover the underlying motives and contextual factors that drive this widespread yet underexplored phenomenon. This exploration sets the stage for the next step, a systematic investigation into the individual and relational determinants of faking orgasm.

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The overarching aim of this thesis is to develop a culturally and psychometrically validated Hungarian questionnaire to measure individual differences in motivations for women's faking orgasm. Beyond constructing a reliable and valid measurement tool, this study seeks to investigate the psychological correlates of this behavior through an evolutionary lens. Specifically, it examines how factors such as sexual motivation, adult attachment styles, emotion regulation, sociosexuality, and mate retention strategies interact to shape the likelihood and context of faking orgasm. This investigation aimed to illuminate the adaptive and maladaptive aspects of this behavior, exploring its role in maintaining relational harmony, managing reproductive dynamics, and navigating socio-sexual challenges. By addressing both the benefits and potential psychological costs, this study aimed to contribute to a nuanced understanding of faking

orgasm as a complex sexual behavior influenced by individual, relational, and cultural factors. This work promises to enhance theoretical models of human mating and provide practical insights for sexual health interventions and relationship counseling.

(References for the Introduction and the Summary sections are at the end of the thesis)

2 | INDIVIDUAL DIFFERENCES IN SEXUAL MOTIVATION

2.1 The Hungarian Version of Sociosexual Orientation Inventory Revised (SOI-R): Sex and Age Differences[1]

Norbert Meskó[1*], András Láng[1], Ferenc Kocsor[1]

[1] University of Pécs, Institute of Psychology, Pécs, Hungary

* Corresponding author

Abstract

Affectionless, uncommitted sexual behavior was formerly interpreted in psychology as a function of individual decisions, a kind of intrapsychic variable. Sociosexual orientation is directly linked to reproductive success, so among other issues, measuring sociosexual orientation has been of great interest for evolutionary scientists. Most recently Penke and Asendorpf (2008) prepared the revised version of Sociosexual Orientation Inventory (SOI-R), which has been used in dozens of studies since its publication. The aim of the current study was to test the usability of the Hungarian version and to analyze the factor structure and internal reliability of the inventory. It was translated and the structure was analyzed on a Hungarian sample (n = 1345, females = 832, males = 513; age: M = 26.37 years, SD = 8.75, range: 16-74). Our results show that the Hungarian version has the same three-factor structure as proposed by Penke and Asendorpf (2008) and is a reliable inventory for further studies of sociosexuality. The sociosexual scores of the two sexes statistically differ in the expected direction: women show lower SOI scores than men. Sociosexual desire decreases with age, whereas older participants report less restricted sociosexual behavior. Sociosexual attitude is unaffected by age. Results are discussed from both evolutionary and life-span developmental points of view.

Keywords: Sociosexual Orientation Inventory, sexual strategies, mate choice, evolution.

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Introduction

Definition and Measurement of Sociosexuality

The first scientific evidence showing that promiscuity is a more characteristic part of the human behavioral repertoire than formerly assumed was published in the Kinsey-reports (Kinsey, Pomeroy, & Martin, 1948; Kinsey, Pomeroy, Martin, & Gebhard, 1953). It was Kinsey who first used the term 'sociosexuality', referring to the individual differences in the willingness to engage in short term, uncommitted sexual intercourse. However, a few decades had to elapse until the publication of the Sociosexual Orientation Inventory (SOI) by Simpson and Gangestad (1991), which enabled the measurement of the openness to promiscuity along a single dimension, a global sociosexuality scale.

The original inventory was composed of seven items, two of which referred to the former sexual behavior of the subject, another two to the expected future behavior, and the last three gave a picture of the general attitude to emotionally uncommitted sex. Thus, two sub-scales, measuring sociosexual behavior and attitude, emerged. The authors (Simpson & Gangestad, 1991) found that men, in general, score higher on the SOI scale than women. The results showed that there are two groups of people from both sexes. Individuals in the first group are more willing to engage in a sexual intercourse without emotional commitment, while those in the second group are more reluctant to get involved in uncommitted sexual relationships. The two groups were referred to as showing *unrestricted sociosexuality* and *restricted sociosexuality*, respectively (Gangestad & Simpson, 1990; Simpson & Gangestad, 1991, 1992). Relatively high SOI scores indicate one's willingness to engage in short-term relations (i.e., having multiple partners over a short period of time), whereas lower scores indicate preference for long-term relationships (i.e., having relatively fewer partners with exclusive sexual access). According to the explanation of Gangestad and Simpson (2000), these are alternative mate choice strategies that lead to different SOI scores.

Evolution of Sex Differences in Sociosexuality

According to an evolutionary psychological perspective, ancestral men and women faced different adaptive problems that threatened their survival and reproduction (Buss, 1994). According to parental investment theory, there is a conflict for both males and females in how much time, effort, and resources to invest in mating versus parenting (Trivers, 1972). For mammals, including humans, males need to invest substantially less in parenting than females to achieve successful reproduction. The fertilization and gestation occur within the female, and,

after birth, mothers provide the primary nutritional support for their offspring until they are weaned. Male investment in offspring may be as little as the sperm produced during copulation.

According to sexual strategies theory males in most mammals can achieve tremendous reproductive success by inseminating many females, making males relatively indiscriminate when it comes to choosing a sex partner (Buss, 1994). Females, in contrast, have much more invested, at least potentially, in a single copulation. The possibility of pregnancy, and the time and energy spent caring for the resulting offspring, favored ancestral females who were selective in mating. Because of the long period of immaturity in humans, ancient women's reproductive interests were often best served by selecting a mate who not only would provide good genes, but who also would invest in her and her offspring. Over evolutionary time, it was also in men's reproductive interests to see to it that their offspring received the support necessary to survive to reproductive age. But the amount and duration of investment necessary to ensure the survival of offspring was less for men than for women. Thus, although both men and women shared a common reproductive goal (getting their offspring to adulthood), the optimal level of investment to achieve this goal was unequal for the sexes, placing males' and females' reproductive interests in conflict (Bjorklund & Shackelford, 1999).

Men and women have evolved different psychological mechanisms as solutions to the adaptive problems unique to their sex. For example, fertilization occurs within the female, and it is the female who gestates and gives birth to the offspring. This greater prenatal investment of the female comes at considerable cost but brings with it certainty of maternity. In contrast, males, who may invest only sperm and the energy necessary to copulate, cannot be certain of paternity.

Human sex differences in parental investment predict sex differences in sexual strategies. These sex differences include the greater inclination of men to pursue short-term casual sex and the greater selectivity of women in choosing a mate, especially in the context of short-term mating. Men nominate more sexual partners as ideal than women do (Schmitt, Shackelford, Duntley, Tooke, & Buss, 2001), and are more willing to engage in short-term, temporary sexual relationships with no commitment (Buss, 2003).

Components of Sociosexuality

Penke and Asendorpf (2008) proposed that contrary to the former assumption of Simpson and Gangestad (1991), sociosexual orientation is not a single global dimension, but consists of three components: sociosexual behavior, sociosexual attitude, and sociosexual desire. To fit this three-factor structure, the original questionnaire had been revised and published as the SOI-R questionnaire (Penke & Asendorpf, 2008).

Sociosexual behavior

Individual differences in the preference for uncommitted sexual relationships are present in the measurable components of the behavior; some people are quite often engaged in romantic affairs without being emotionally involved, while others prefer more monogamous, long-lasting, emotionally committed relations. Since in the evolutionary past the frequency of sexual intercourses correlated with the number of offspring, unrestricted sociosexual behavior was favored by sexual selection (Jackson & Kirkpatrick, 2007). Therefore, susceptibility to short-term relations can be understood as an evolutionary adaptation. That is, ecological and social factors of the environment modify the developmental trajectory and influence unconscious reproductive decisions. From a developmental perspective, sociosexual behavior also gives information about whether the available resources (time, effort, money, etc.) were invested in short-term partners or in long-term, emotionally committed relationships. Biological models based on life-history theory (LHT) have already revealed such interconnections (Roff, 1992). Consequently, sociosexual behavior measured at any point of life is related to individual experiences of mate choice, and is likely to indicate future behavioral tendencies as well (Penke & Asendorpf, 2008).

Sociosexual attitude

Sociosexual attitude is a cognitive-affective evaluation related to uncommitted sexuality (Penke & Asendorpf, 2008). Individual differences in attitude, of course, may be influenced by cultural characteristics (Schaller & Murray, 2008; Schmitt, 2005b). Cultural values (e.g. morality), sexuality related traditions (e.g. religious rules), and institutionalized conventions (e.g. marriage systems) all might affect the sociosexuality of a particular population (Low, 2007). In their study, Baumeister and Twenge (2002) found that it was not men who suppressed female sexuality, but it was the interest of women to eliminate sexual rivals, because the scarcity of sexual partners increases the value of such. So, intrasexual rivalry might as well have shaped the negative attitude of women towards unrestricted sociosexuality.

Sociosexual desire

Sociosexual desire is a motivational state similar to general sexual desire characterized by the enhancement of sexual interest, arousal, and sexual fantasies (Penke & Asendorpf, 2008; Simpson & Gangestad, 1991; Simpson, Wilson, & Winterheld, 2004). In contrast to general sexual desire, unrestricted sociosexual desire stems mainly from attractiveness, hence it is related to physical appearance. The object of sociosexual desire is a potential sexual partner who can differ from a potential long-term partner in an emotionally committed relationship.

Therefore, by measuring sociosexual desire, the motivational basis of long-term and short-term mate choice tactics can be differentiated.

Recent Research on Sociosexuality

In a first group of studies, researchers used SOI-R for testing hypothetical link between sociosexuality and face preference. Boothroyd, Cross, Gray, Coombes, & Gregson-Curtis (2011) found perceiving facial correlates of sociosexuality. Their results showed that more facially masculine men report stronger preferences for uncommitted sexual relationships. Participants identified as having unrestricted sociosexuality if female, more masculine if male, and more attractive if female. Quist et al. (2012) found new evidence for potentially adaptive variation in women's symmetry preferences that is consistent with trade-off theories of attraction. Their results showed that women's sociosexuality, and their sociosexual attitude in particular, predicted their preferences for symmetry in men's, but not women's faces; women who reported being more interested in short-term, uncommitted relationships demonstrated stronger attraction to symmetric men.

Mouilso and Calhoun (2012) examined the link between pathological personality traits (i.e., narcissism and psychopathy) and perpetration of sexual aggression among college men. They explored how sexuality impacts the operation of these personality traits in the context of sexual aggression. The researchers described a model proposed that sociosexuality (i.e., willingness to engage in frequent, casual sexual encounters) would explain the associations of narcissism and psychopathy with perpetration of sexual aggression. According to their results, participants who scored in the upper third of the distribution of all three personality variables were twice as likely to report perpetration relative to the sample as a whole. Both narcissism and psychopathy distinguished perpetrators from nonperpetrators, but with sociosexuality included in the model neither personality trait continued to explain significant variance in perpetration.

Jonason, Teicher, and Schmitt (2011) attempted to replicate and extend the construct validity of the Ten Item Personality Inventory (TIPI; Gosling, Rentfrow, & Swann, 2003) by relating it to sociosexuality and self-esteem. The researchers replicated some of the most well documented Big Five correlations: Self-esteem was negatively correlated with neuroticism and positively with extraversion; sociosexuality was positively correlated with extraversion and negatively with agreeableness.

Objectives

The aim of the recent study was to translate the Revised Sociosexual Orientation Inventory (SOI-R; Penke & Asendorpf, 2008) into Hungarian, and test its internal reliability and validity. We assumed that, due to the underlying ultimate behavioral causes (see details in

Discussion), the structure of the questionnaire is universal and independent of cultural influences, therefore, the structure and psychometric indices of the SOI-R can be replicated with a Hungarian sample in our study. Furthermore, we predicted that between-sex differences would be similar to those found in former studies, wherein females showed more restricted sociosexuality than males.

Methods

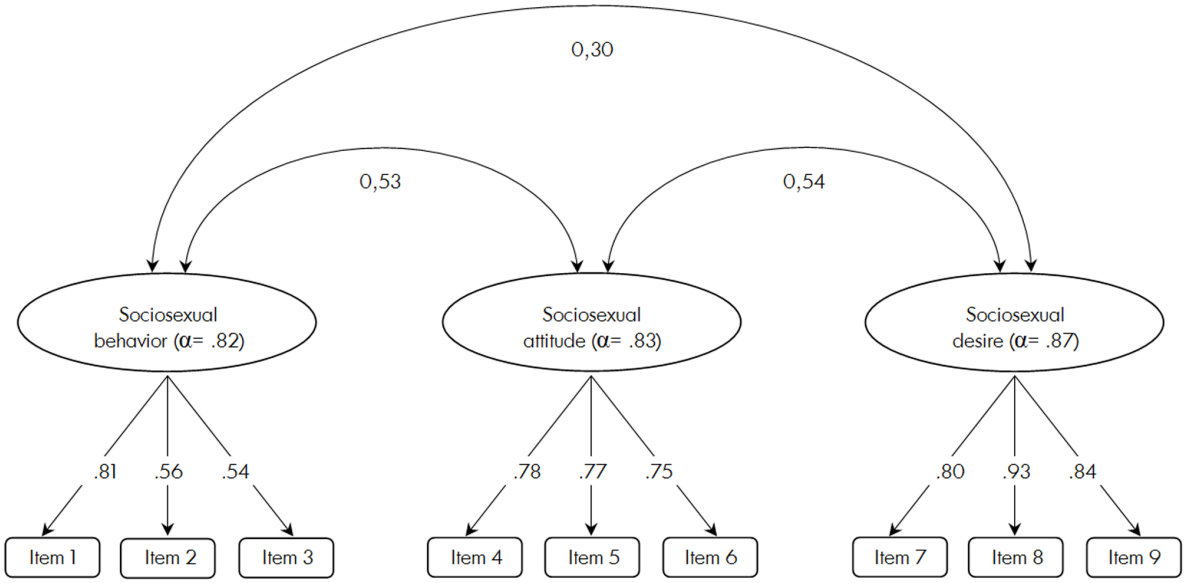
Participants

In this study, data from 1345 participants were analyzed (age: *M* = 26.37 years, *SD* = 8.75, range: 16-74). From our participants 832 were female (age: *M* = 25.20 years, *SD* = 6.75, range: 16-68), and 513 male (age: *M* = 28.27 years, *SD* = 11.00, range: 18-74). The SOI-R questionnaire was used in multiple studies over a one-year period in online format (www.surveymonkey.com). Volunteers were recruited through various electronic media, such as web-based social networks, mailing lists of the university, etc. Though useful means for assessing sexual orientation (i.e., to see if a participant is hetero-, bi-, or homosexual) are available (e.g. the Kinsey-scale; Kinsey, Pomeroy, & Martin, 1948), since the aim of the study was to compare the sociosexuality of an average female and male population, this question was not addressed.

Instrument

The SOI-R consists of three sub-scales: (1) sociosexual behavior – SOI-B; (2) sociosexual attitude – SOI-A; and (3) sociosexual desire – SOI-D. Each sub-scale consists of 3 items. The original SOI-R was validated in two forms: questions of the basic form have to be answered on 9-point Likert-scales. Besides, a questionnaire with 5-point Likert-scales for subjects with lower socioeconomic status was prepared as well. The version with the 5-point Likert-scale is less differentiated, so it is easier to understand. The current study investigates the usability of the form with 9-point Likert-scales. The 9 items of the questionnaire were translated into Hungarian using both the English and the German version to preserve the original sense of the SOI-R. To check the accuracy of the translation, the English back-translation was compared to the original English version (it can be found in Appendix A,) (SOI-R in 25 different languages is available at www.larspenke.eu). Hungarian version can be found in Appendix B.

Figure 1 *Confirmatory factor analysis of the Hungarian version of the Sociosexual Orientation Inventory*



Note. Each factor weights and each covariance is significant ($p < .001$). Cronbach's α for global SOI-R (9 items) is .85.

Statistical Analysis

After exploratory factor analysis (EFA), we tested the fit of the data from our Hungarian sample to the structure of SOI-R (suggested by Penke and Asendorpf, 2008) using confirmatory factor analysis (CFA). To assess the reliability of the SOI-R, we examined the values of Cronbach's alphas. We used Pearson's linear correlation to test interrelations between the SOI-R scales, and between the SOI-R scales and the age of the participants. Scores of the two sexes on the three sub-scales were compared with ANOVAs. For the analyses, IBM SPSS Statistics 19.0 and Amos 18.0 software was used.

Results

Structure and Psychometric Properties of the SOI-R

Exploratoy factor analysis (PCA, Varimax rotation) yielded a three component solution (Table 1) based on the eigenvalues of the components. The components consisted of the same items as suggested by Penke and Asendorpf (2008), so, they were labeled accordingly.

Table 1 *Results of Exploratory Factor Analysis*

SOI-R items	Component 1	2	3
SOI-R scale: Sociosexual desire			
8. How often do you experience sexual arousal when you are in contact with someone you are not in a committed romantic relationship with?	.878		
7. How often do you have fantasies about having sex with someone you are *not*in a committed romantic relationship with?	.874		
9. In everyday life, how often do you have spontaneous fantasies about having sex with someone you have just met?	.840		
SOI-R scale: Sociosexual attitude			
4. Sex without love is OK.		.843	
5. I can imagine myself being comfortable and enjoying "casual" sex with different partners.		.799	
6. I do not want to have sex with a person until I am sure that we will have a long-term, serious relationship.		-.791	
SOI-R scale: Sociosexual behavior			
2. With how many different partners have you had sexual intercourse on one and only one occasion?			.877
3. With how many different partners have you had sexual intercourse without having an interest in a long-term committed relationship with this person?			.860
1. With how many different partners have you had sex within the past 12 months?			.756
% of Variance Explained	26.862	25.025	24.770

The fit of this three-factor structure to our data was verified with CFA (maximum likelihood method). The model showed excellent fit: $\chi^2(27) = 232.378$, $p < .001$; TLI = 0.96; CFI = 0.97; RMSEA = 0.075, 95% CI [0.066, 0.084]. The factor weights and the covariances between the scales are shown in Figure 1. All scales proved to be internally consistent with Cronbach's alphas of .80 and higher (for details see Figure 1).

The interrelation of the sub-scales and the global sociosexuality index is shown in Table 2. Pearson's correlations between the sub-scales ranged from weak to moderate, whereas the sub-scales showed strong correlation with the global index.

Table 2 *Pearson's Correlations of the Sub-Scales and the Total Score of the SOI-R*

	Sociosexual behavior		Sociosexual attitude		Sociosexual desire	
	Females (*n* = 832)	**Males (*n* = 513)**	**Females (*n* = 832)**	**Males (*n* = 513)**	**Females (*n* = 832)**	**Males (*n* = 513)**
Sociosexual attitude	*r* = .50	*r* = .43				
Sociosexual desire	*r* = .20	*r* = .23	*r* = .39	*r* = .47		
Global sociosexual index	*r* = .69	*r* = .68	*r* = .89	*r* = .86	*r* = .67	*r* = .76

Note: p < .01 for all correlations.

Age and Sociosexuality

It was assumed that the correlations might differ between the two sexes, so coefficients were calculated separately for both sub-samples (Table 3). The age of both men and women correlated positively and significantly with the sociosexual behavior, whereas it showed a negative correlation with sociosexual desire. This means that with increasing age, both men and women exhibited more unrestricted sociosexual behavior and experienced less sociosexual desire. Neither the sociosexual attitude, nor the total SOI-R scores showed any significant correlations with age in the two groups.

Table 3 *Linear Correlations of Age and Sociosexuality of the Two Subgroups*

		Sociosexual behavior	Sociosexual attitude	Sociosexual desire	SOI-R global score
Age	Females (*n* = 832)	*r* = .114*	*r* = .019	*r* = -.140**	*r* = -.005
	Males (*n* = 513)	*r* = .126*	*r* = -.037	*r* = -.251**	*r* = -.058

Note: *p < .005. **p < .001.

Between-Sex Comparisons

The scores of female and male participants on the sub-scales of the SOI-R, and their global sociosexual index were compared with independent samples t-tests (Table 4). The results confirmed our expectations. The sub-scales (behavior, attitude, desire) and the global index showed significant differences between the sexes; men scored higher than women on all scales.

Table 4 *SOI-R Scale Scores for Men and Women, the Results of ANOVAs; df = 1 in Each Case*

	Females (*n* = 832)		**Males (*n* = 513)**			
SOI-R scales	***M***	***SD***	***M***	***SD***	**F**	***p***
Behavior	7.03	4.22	8.10	5.41	16.447	< .001
Attitude	14.17	7.42	18.10	7.30	19.792	< .001
Desire	8.57	4.89	14.14	6.65	310.668	< .001
Global sociosexual index	29.78	12.80	40.34	14.94	189.908	< .001

Discussion

The current study aimed to analyze the factor structure of the Hungarian version of the Sociosexual Orientation Inventory Revised (SOI-R). The results showed that the Hungarian version has the same three-factor structure as proposed by Penke and Asendorpf (2008), hence it is a reliable instrument which has three sub-scales of high internal consistency. The correlations between the sub-scales and the global sociosexuality index corresponded with the psychometric properties of the English version (Penke & Asendorpf, 2008).

The fact that males scored higher than females on all sub-scales is in line with other research results (e.g. Schmitt et al., 2003). An appropriate evolutionary explanation for the sex differences in sociosexuality is delivered by the theory of sexual strategies (Buss & Schmitt, 1993). The difference between sexes is a direct consequence of parental investment theory (Trivers, 1972), which claims that in many species the reproductive success of one sex, but not that of the other, is directly and strongly influenced by the number of available potential sexual partners. On the one hand, males generally invest much less energy and time in offspring than females do. Therefore, their genetic representation in the next generation can be increased successfully by increasing the number of mating partners. This effort is limited by the number of susceptible females tolerating and/or accepting an uncommitted sexual relation. On the other

hand, female reproductive fitness can be increased by acquiring the resources (food, territory) monopolized by males, and not by the number of potential mating partners. Because these environmental factors (i.e. resources), exert a strong influence on females' capacity to raise their young, they usually seek out less sexual partners than males (Symons, 1979). In short, women use their cognitive-emotional-motivational capacity primarily to evaluate the potential partner's willingness and ability for parental investment. At the same time, men have been under evolutionary pressure to mate with as many sexual partners as possible (Buss & Schmitt, 1993).

Although it was found that the global index of the SOI-R did not correlate with age, the sub-scales showed a more complex pattern. Both men and women showed more unrestricted sociosexual behavior as their age increased (i.e. experience casual sexual intercourses more frequently), and at the same time the sociosexual desire of the older participants was lower than that of the younger individuals. Sociosexual attitude seemed to remain unaffected by age.

Sexual motivation of both sexes is based physiologically on the level of sex-hormones (testosterone) that decreases with age (Edelstein, Chopik, & Kean, 2011). The increase of sociosexual behavior is seemingly in contradiction with the fact that older individuals have generally lower desire. The explanation is that some questions of the SOI-R refer to the whole lifetime. Older people might have had more sexual opportunities during their life, while younger ones, though their desire is higher, had less time to achieve their sexual goals.

Sociosexual attitude, in contrast to behavior and desire, is not influenced by age; though older people might have more experiences, their attitude to casual sex does not become more permissive. Attitude is less directly based on hormonal functioning, it is much more the product of socialization and other environmental inputs. Based on the theory of cognitive dissonance (Festinger, 1962), we assume that sociosexual attitude remains unchanged until the desires and self-image of the individual, and social expectations directed towards the individual are in harmony. In an average population the sociosexual desire decreases with age, and probably this corresponds to the general societal ideas about the sexuality of elderly people (Trudel, Turgeon, & Piché, 2000). Hence the attitude does not need to be changed. The global index of the SOI-R is independent of age, since younger individuals have generally higher desire and less experience, and older individuals have less desire and more experience. The two factors, together with the age-independent sociosexual attitude scale, counterbalance each other, resulting in an age-independent global score.

Conclusions

Individual differences in sexual commitment have already been revealed by the Kinsey-reports (Jonason & Buss, 2012; Kinsey, Pomeroy, & Martin, 1948; Kinsey, Pomeroy, Martin, & Gebhard, 1953). It was also Kinsey, who introduced the term 'sociosexuality' to describe the extent of individuals' willingness to engage in uncommitted sexual relations. Since the trade-off between long- and short-term mate choice strategies (i.e. sex with or without commitment) has been a central issue in evolutionary psychology (Schmitt, 2005a), sociosexuality and its objective measurement have become important for this discipline.

We translated the SOI-R (Penke & Asendorpf, 2008) into Hungarian and investigated its psychometric properties. CFA confirmed the three-factor structure of the Hungarian version. The comparison of the SOI-R scores of men and women revealed sex differences in the expected direction (i.e. men scoring higher on all subscales). These results are in line with parental investment theory (Trivers, 1972). The relationship between age and the different aspects of sociosexuality was explained using both physiological and social psychological points of view. Our results prove the Hungarian version of the SOI-R to be a reliable instrument for measuring uncommitted sexuality on the level of behavior, attitude and desire. However, further studies have to test the validity of the Hungarian version of SOI-R in more detail. Beside its use in research, the SOI-R could be an inventory suitable for clinical work, especially in marital and sex therapy.

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Competing Interests

The authors have declared that no competing interests exist.

Appendix A SOI-R in English

The revised Sociosexual Orientation Inventory (SOI-R)

Please respond honestly to the following questions:

1. With how many different partners have you had sex within the past 12 months?

□	□	□	□	□	□	□	□	□
0	1	2	3	4	5-6	7-9	10-19	20 or more

2. With how many different partners have you had sexual intercourse on *one and only one*occasion?

□	□	□	□	□	□	□	□	□
0	1	2	3	4	5-6	7-9	10-19	20 or more

3. With how many different partners have you had sexual intercourse without having an interest in a long-term committed relationship with this person?

□	□	□	□	□	□	□	□	□
0	1	2	3	4	5-6	7-9	10-19	20 or more

4. Sex without love is OK.

1 □	2 □	3 □	4 □	5 □	6 □	7 □	8 □	9 □
Strongly disagree								Strongly agree

5. I can imagine myself being comfortable and enjoying "casual" sex with different partners.

1 □	2 □	3 □	4 □	5 □	6 □	7 □	8 □	9 □

Strongly disagree Strongly agree

6. I do *not* want to have sex with a person until I am sure that we will have a long-term, serious relationship.

1 □ 2 □ 3 □ 4 □ 5 □ 6 □ 7 □ 8 □ 9 □

Strongly disagree Strongly agree

7. How often do you have fantasies about having sex with someone you are *not* in a committed romantic relationship with?

□ 1 – never

□ 2 – very seldom

□ 3 – about once every two or three months

□ 4 – about once a month

□ 5 – about once every two weeks

□ 6 – about once a week

□ 7 – several times per week

□ 8 – nearly every day

□ 9 – at least once a day

8. How often do you experience sexual arousal when you are in contact with someone you are *not* in a committed romantic relationship with?

□ 1 – never

□ 2 – very seldom

□ 3 – about once every two or three months

□ 4 – about once a month

□ 5 – about once every two weeks

□ 6 – about once a week

□ 7 – several times per week

□ 8 – nearly every day

□ 9 – at least once a day

9. In everyday life, how often do you have spontaneous fantasies about having sex with someone you have just met?

□ 1 – never

□ 2 – very seldom

□ 3 – about once every two or three months

□ 4 – about once a month

□ 5 – about once every two weeks

□ 6 – about once a week

□ 7 – several times per week

□ 8 – nearly every day

□ 9 – at least once a day

Items 1-3 should be coded as 0 = 1, 1 = 2, 2 = 3, 3 = 4, 4 = 5, 5-6 = 6, 7-9 = 7, 10-19 = 8, 20 or more = 9; they can then be aggregated (i.e., summed or averaged) to form the Behavior facet (α = .85). After reverse-coding item 6, items 4-6 can be aggregated to form the Attitude facet (α = .87). Aggregating items 7-9 results in the Desire facet (α = .86). Finally, all nine items can be aggregated to a total score of global sociosexual orientation (α = .83). When items 1-3 are presented with open response format instead of the rating scales, items 2, 4, and 7 of the original SOI can be added to the SOI-R to allow for calculating the SOI total score in addition to the SOI-R scores. In this case, the open responses should be recoded to the rating scale format (i.e., 0 = 1, 1 = 2, ..., 20 to max. = 9) before the SOI-R scores are determined. (Downloaded from: http://larspenke.eu/pdfs/SOI-R%20Manual.pdf)

Appendix B Hungarian Translation of SOI-R

Szocioszexuális orientáció kérdőív (SOI-R)
Kérem, válaszoljon őszintén a következő kérdésekre!

1. Hány különböző partnerrel létesített szexuális kapcsolatot az elmúlt 12 hónapban?

□	□	□	□	□	□	□	□	□
0	1	2	3	4	5-6	7-9	10-19	20 vagy több

2. Hány különböző partnerrel létesített alkalmi szexuális kapcsolatot (közösült) élete során úgy, hogy az egy és valóban csak egyetlen alkalom volt?

□	□	□	□	□	□	□	□	□
0	1	2	3	4	5-6	7-9	10-19	20 vagy több

3. Hány különböző partnerrel létesített már szexuális kapcsolatot (közösült) úgy, hogy nem kívánt ezzel a személlyel hosszú távú párkapcsolatot kialakítani?

□	□	□	□	□	□	□	□	□
0	1	2	3	4	5-6	7-9	10-19	20 vagy több

4. A szexuális érintkezés szerelem nélkül is elfogadható.

1 □	2 □	3 □	4 □	5 □	6 □	7 □	8 □	9 □
Egyáltalán nem értek egyet								Teljesen egyetértek

5. Elképzelhetőnek tartom, hogy a különböző partnerekkel folytatott „alkalmi” szexuális érintkezés élvezetes lehet számomra.

1 □	2 □	3 □	4 □	5 □	6 □	7 □	8 □	9 □
Egyáltalán nem értek egyet								Teljesen egyetértek

6. Senkivel nem szeretnék szexuális kapcsolatot létesíteni addig, amíg nem vagyok biztos benne, hogy a kapcsolat hosszú távú és komoly lesz.

1 □	2 □	3 □	4 □	5 □	6 □	7 □	8 □	9 □
Egyáltalán nem értek egyet								Teljesen egyetértek

7. Milyen gyakran vannak szexuális fantáziái olyan valakiről, akivel ön nem áll elkötelezett párkapcsolatban?

□ 1 – soha

□ 2 – nagyon ritkán

□ 3 – két-háromhavonta

□ 4 – havonta

□ 5 – kéthetente

□ 6 – hetente

□ 7 – heti több alkalommal

□ 8 – majdnem minden nap

□ 9 – naponta legalább egyszer

8. Milyen gyakran tapasztal szexuális izgalmat, amikor olyan valakivel kerül kapcsolatba, akivel ön nem áll elkötelezett párkapcsolatban?

□ 1 – soha

□ 2 – nagyon ritkán

□ 3 – két-háromhavonta

□ 4 – havonta

□ 5 – kéthetente

□ 6 – hetente

□ 7 – heti több alkalommal

□ 8 – majdnem minden nap

□ 9 – naponta legalább egyszer

9. A mindennapok során milyen gyakran vannak spontán fantáziái arról, hogy olyan ismeretlen személlyel érintkezik szexuálisan, akivel éppen csak találkozott?

□ 1 – soha

□ 2 – nagyon ritkán

□ 3 – két-háromhavonta

□ 4 – havonta

□ 5 – kéthetente

□ 6 – hetente

□ 7 – heti több alkalommal

□ 8 – majdnem minden nap

□ 9 – naponta legalább egyszer

Instrukciók az értékeléshez. Az 1-3. itemek kódolása a következő: 0=1, 1=2, … 10-19=8, 20 vagy több=9. Az első három item összege adja viselkedésre vonatkozó alskálát. A 6. Item fordított kódolású. A 4-6. item összege adja az attitűdökre vonatkozó alskálát. A 7-9. Item összege adja a vággyal kapcsolatos alskálát. Az 1-9. itemek összeadásával megkaphatjuk a globális szocioszexuális orientációt.

2.2 Why Hungarians Have Sex (YSEX?-HSF)[2]

Norbert Meskó[1]*, Dóra Szatmári[1], András Láng[1], Cindy M. Meston[2], David M. Buss[2]

[1]Institute of Psychology, University of Pécs, Pécs, Hungary

[2]Department of Psychology, University of Texas at Austin, Austin, TX, USA

*Corresponding author

Abstract

Using the same methodology as Meston and Buss (2007), three studies were conducted on a Hungarian sample (total N = 4913) which corroborate previous findings on the universal diversity of sexual motivation. Study 1 (N = 2728; 1069 women and 1659 men) identified 197 reasons for having sex based on participants' free responses. In Study 2 (N = 1161; 820 women and 341 men), participants indicated the extent to which each of the 197 reasons had led them to have sexual intercourse. Factor analyses yielded three factors and 24 subfactors. This differed from the original YSEX? four-factor questionnaire. In Study 3 (N = 1024; 578 women and 446 men), a reliable and valid 73-item short form version of the YSEX? questionnaire was developed in a Hungarian sample (YSEX?-HSF). In addition to similarities and differences in the factor structure, we found important links between reasons for having sex and age, gender, personality, and mating strategy. For example, number of reasons for having sex tended be higher in younger compared to older participants. Men exceeded women on having sex for novelty-seeking and infidelity opportunities, whereas women exceeded men on having sex for relationship commitment and mate retention. Extra- version and neuroticism were linked with reasons for having sex, and those who pursued a short-term mating strategy reported having sex for a larger variety of reasons.

Keywords: sexual motivation, age and gender differences, intercourse, Hungarian adaptation.

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Introduction

Over the past 40 years, several measures of sexual motivation have been published. Nelson (1978) was the first to develop a self-report measure of sexual motivation. A factor analysis of participants' responses revealed five distinct reasons for sexual activity: (1) love and affection, (2) pleasure, (3), conformity, (4) recognition-competition, and (5) power (dominance and submission). Nelson separately analyzed male and female participants' responses and rated 10 sexual variables ranging from the frequency of casual sex to that of reaching orgasm during sexual intercourse. The three most important predictors of sexual variables were conformity, love, and pleasure (in descending order).

Leigh (1989) revealed the following seven reasons for having sex: (1) for pure pleasure, (2) to express emotional closeness, (3) to reproduce, (4) because one's partner wants to, (5) to please one's partner, (6) to make a conquest, and (7) to relieve sexual tension. More recently, Hill and Preston (1996) proposed sexual motivation is comprised of the following factors: (1) feeling emotionally valued by one's partner, (2) expressing feelings of emotional value for one's partner, (3) obtaining relief from stress, (4) providing one's partner with nurturance, (5) enhancing one's feelings of power, (6) experiencing the power of one's partner, (7) experiencing pleasure, and (8) procreation. Feeling valued by and valuing one's partner were similar to Nelson's love and affection factor ($r < 0.60$), while enhancing one's power and experiencing the partner's power were identical to Nelson's dominance and submission factors, respectively. While the questionnaire developed by Hill and Preston (1996) did not include a measure of either conformity or recognition, it did assess stress reduction and procreation as opposed to Nelson's questionnaire.

Cooper et al. (1998) identified the major dimensions of sexual motivation in a neurological framework based on the dual system of behavior activation (BAS) and behavior inhibition (BIS; see in detail Gray, 1972, 1981). Cooper et al. divided sexual motives into four categories: (1) individual approach motives, e.g., using sex to enhance physical pleasure or positive emotional experience (i.e., enhancement motives); (2) individual avoidance motives, e.g., using sex to cope with threats to self-esteem or to minimize or avoid negative emotions (i.e., coping motives); (3) social approach motives, e.g., using sex to get closer to the partner (i.e., intimacy motives); and (4) social avoidance motives, e.g., using sex to avoid social rejection or to improve social acceptance (i.e., approval motives).

Meston and Buss (2007) pointed out that sexual activity has a much more complex, multifaceted motivational background than previously assumed. In their study, Meston and Buss

identified 237 distinct reasons for why men and women engage in sexual intercourse. The reasons were compiled from open ended responses given by individuals aged 17 to 52 years of age, and then administered to over 1500 undergraduate students for the purposes of conducting factor analyses and frequency distributions. Of the 237 distinct reasons reported, 142 loaded onto four primary factors that were equivalent in men and women: Physical Reasons, Goal Attainment Reasons, Emotional Reasons, and Insecurity Reasons. Separate principal component analyses conducted on each of these primary factors revealed between two and four independent subfactors for each of the primary factors.[Footnote 1]

Recently, Meston et al. (2019) developed a short form of the original YSEX? questionnaire (YSEX?-SF). By reducing the number of items from 144 to 28, Meston et al. developed a version that showed a factor structure identical to that of the original questionnaire, with good internal consistency (Cronbach's $\alpha = 0.44$ to 0.91), and correlations comparable to the original factors ($r = 0.84$ to 0.94).

Although Meston and Buss (2007) point out the need for research on and development of measures of culture-specific patterns of sexual motives in non-American populations, no such measure has yet been developed to our knowledge. However, there are studies that successfully replicated the factor structure of the original Reasons for Having Sex Questionnaire (YSEX?) in different cultural contexts. In a Norwegian study, 1327 university students rated the 237 translated items of the original pool on which the American questionnaire was based (Kennair et al., 2015). The findings showed that the original 13 factors could be replicated in a more gender-egalitarian country such as Norway. The Turkish version of the YSEX? questionnaire was also based on the translated items of the original pool, which were rated by 401 respondents (234 women; age: $M = 23.45$, range: 18–66; Ozcan et al., 2017). The factor structure of the Turkish version also corresponded to that of the original questionnaire. Gouvernet et al. (2017) translated the original YSEX? questionnaire to French and developed the French version with a sample of 657 respondents (526 women, 131 men; age: $M = 22.6$). Their findings showed that women's and men's sexual motivation has different structures. Gouvernet et al. (2017) argued that a reason for this might be the fact that the female network of sexual motives is more compartmentalized and less diffuse than the male network. On the other hand, the male network of sexual motives is more flexible, i.e., motives are more interchangeable for men. Furthermore, Gouvernet et al. (2017) conducted cross-cultural comparisons, since their study also involved an American sample in addition to the French sample. They found more pronounced gender differences in the French sample.

Several researchers highlight the role of social location in multifaceted sexual desire (see Chadwick et al., 2017 for a review) and emphasize that more accurate measurement of a phenomenon requires self-developed questionnaires for that community/subculture rather than translating measures from other societies. Meston and Buss (2007) raised several important questions requiring further research, including whether the factors that they revealed in their North American sample are replicable in different cultures, whether the frequency distribution of motives are culturally specific, whether differences between genders in motives may differ culturally, and whether sexual motives differ according to age and different stages of the life cycle. The primary aim of the present study was to begin examination of these questions in a European sample. A secondary aim of the study was to develop a translated short version of the YSEX? in Hungarian.

We adopted the methodology used by Meston and Buss (2007), and all procedures were kept as closely as possible to that of Meston and Buss in order to allow comparisons to be made between studies. We conducted three studies.

Study 1: Item Generation

Method

Participants and Procedure

Reasons for having sex were collected from 2728 respondents (age: $M = 34.84$, SD = 9.15, range: 18–65), most of whom (73.81%) completed secondary or tertiary education (13 to 15 years of formal education). The sample included 1069 women (age: $M = 32.29$, SD = 8.79, range: 18–65) and 1659 men (age: $M = 36.54$, SD = 8.99, range: 18–65). Respondents were invited to participate in an anonymous online survey through popular Hungarian websites (http://randiblog.blog.hu, http://elixironline.hu, http://www.marieclaire.hu), social media (e.g., www.facebook.com) and a university mailing list (University of Pécs Faculty of Humanities). The online form was available at www.surveymonkey.com for approximately one month (from 10.10.2012 to 03.11.2012). Respondents were given the following instructions: “Please list all the reasons why you or those you are familiar with or know had sexual intercourse with someone in the past. (You may also add reasons presented in films or books.) We do not expect you to provide complete stories but to list reasons only. Please list as many reasons as you can. Try to describe each reason in a short sentence or in a single word. Enter each reason in a separate field.” Respondents’ gender, age, and the number of completed years in education were also recorded.

Results

The participants provided a total of 6184 responses. After removing irrelevant responses from the initial pool, the remaining 1231 reasons were subjected to further selection. The first and second authors removed repeated and synonymous responses and compiled a list including 197 reasons. The complete list is not presented here due to its large size.

This list was subsequently presented to another sample (see details in Study 2) in a standard questionnaire format, in which a short description of each reason was accompanied by a 5-point rating scale with scale interval anchors being, None of my sexual experiences (1), A few of my sexual experiences (2), Some of my sexual experiences (3), Many of my sexual experiences (4), and All of my sexual experiences (5). Respondents used the rating scales to indicate how frequently each reason had led them to have sexual intercourse in the past. The questionnaire contained the following instructions: "Several reasons may lead people to have sexual contact (e.g., intercourse) with a partner. The below list enumerates such reasons. Please indicate how frequently each reason led you to have sex with someone in the past. For example, if a reason has never led you to have sex, indicate 1 on the rating scale next to the specific reason. By contrast, if a reason frequently led you to have sex, indicate 5 on the rating scale. If you have never had sexual intercourse, use the rating scales to indicate the likelihood that each reason would lead you to have sex. "I had sex because…"

Study 2: Psychometric Analysis

Method

Sample and Procedure

Respondents were invited through the above-mentioned online platforms to anonymously complete the 197-item questionnaire. The online form was available for approximately one month (from July 3, 2014 to August 12, 2014). Since respondents were reached through the same channels as those used in Study 1, it is possible that the two samples partly overlapped. A total of 1172 respondents completed the questionnaire. Eleven respondents reported never having had sexual intercourse and were excluded from the sample. The final sample consisted of 1161 respondents (age: $M = 34.35$, SD = 12.39, range: 18–73), which included 820 women (age: $M = 30.70$, SD = 9.88, range: 18–65) and 341 men (age: $M = 43.14$, SD = 13.36, range: 18–73).

The mean age of men was significantly higher than that of women ($F(1, 1159) = 306.90$, $p < 0.001$). The distribution of relationship status was as follows: single: 19.37% (women: 18.80%, men: 19.60%), dating someone (for less than 6 months): 9.64% (women: 10.60%, men: 7.30%), permanent relationship/married 66.13% (women: 66.00%, men: 67.70%), other: 4.86% (women: 4.60%, men: 5.30%. On average, respondents had their first sexual intercourse at the

age of 17.58 (SD = 2.66). Men had their first sexual intercourse significantly later (M = 18.42, SD = 3.24) than women (M = 17.23, SD = 2.30; $F(1, 1159) = 49.61$, $p < 0.001$). The mean number of respondents' sexual partners in the past was 14.82 (SD = 42.48). Men reported to have had significantly more sexual partners (M = 23.84, SD = 51.00) than women (M = 11.08, SD = 37.69; $F(1, 1159) = 22.12$, $p < 0.001$).

Results

Item Analysis

The most and least frequent reasons for having sexual intercourse are presented in Supplement 1/A and 1/B.

Gender Differences in Reasons for Having Sexual Intercourse

A number of interesting gender differences emerged. Men more than women had sex for sexual variety and had sex when a regular partner was unwilling or unable to do so. Men indicated that they liked the hunt and the risk involved. Women more than men had sex to deepen an existing romantic commitment, to strengthen an emotional bond or attachment, and prevent a partner from leaving. Gender differences in reasons for having sexual intercourse are presented in Supplement 1/C.

Principal Component Analysis

Responses to the 197 items were subjected to principal component analyses (PCAs) following the procedure used by Meston and Buss (2007). For data reduction, PCA was deemed for an appropriate method given the data-driven (as opposed to theory driven) nature of our study. Instead of hypothesizing latent constructs that make items correlate (i.e., using EFA), we simply wanted to reduce data, i.e., summarize the many reasons why people have sex into fewer dimensions that can reproduce much of the covariance in the dataset (Abdi & Williams, 2010). Since the items differed in their variances, all PCAs were conducted on z-score transformations standardized on the combined sample of men and women. A separate PCA including all 197 items was conducted for each gender group. Direct oblimin rotation with Kaiser normalization was used for the analyses, since related factors were expected. The scree plot showed that the three, four, and five-factor solutions were adequate. KMO measure (0.964) and Bartlett's Test of Sphericity (approx. $\chi^2(19{,}306) = 132{,}526.73$; $p < 0.001$) indicated that data were appropriate for factor analysis. The three-factor solution yielded the most consistent pattern of loadings for both men and women, which explained 32% of the total variance in each gender group. The three factors were labeled (1) Personal Goal Attainment, (2) Relational Reasons, (3) and Sex as Coping. As followed by Meston and Buss (2007), the comparability coefficient proposed by Nunnally (1978) was calculated in order to test the correlations between corresponding factors

derived from each gender group. The coefficients of correlation between men's and women's factors were as follows: Personal Goal Attainment: $r(46) = 0.27$; Relational Reasons: $r(55) = 0.96$; Sex as Coping $r(43) = 0.31$; $p < 0.001$ in all three cases. Since men's and women's responses yielded identical factor structures, responses of the overall sample to the 197 items were also subjected to a PCA restricting the number of factors to three and using direct oblimin rotation. The three obtained factors explained 33% of the total variance, and each factor included the expected items the same items as in gender-split analyses (see Table 1).

Table 1 *Factor analysis of the 197 item YSEX?-H questionnaire in a combined sample of men and women*

Item Description	Factor		
	Personal Goal Attainment	Relational Reasons	Sex as Coping
For the hunt.	.763		
I needed a one-night stand.	.726		
Out of longing for adventure.	.680		
It was a challenge.	.626		
I wanted a new experience.	.613	-.333	
I took the opportunity.	.609		
Out of curiosity.	.602	-.338	
It was forbidden.	.595		
I wanted to discover the unknown.	.565	-.341	
I wanted to boost my ego.	.560		
I wanted to seek experience.	.558	-.365	
I love variety.	.551	-.329	
My partner is not adventurous enough (so I had sex with someone else).	.546		
I wanted the excitement of cheating on my partner.	.540		
We hooked up in the heat of the moment.	.513		
The person had an exotic appearance.	.509		
I wanted to experience a desire for freedom.	.498		
I wanted to get the other person.	.497		
I wanted to get some experience.	.495		
My partner did not want to have sex with me (so I had sex with someone else).	.490		
I am addicted to sex.	.484		
It was a seduction/I was seduced.	.482	-.320	
I wanted to show off.	.477		
The other person was acting sexing.	.468		
Because it was fun.	.457	-.337	
Out of vanity.	.455		
The other person offered himself or herself.	.449		
For fun.	.442		
I wanted to be cool.	.441		
Out of infidelity.	.431		
My partner was not able to have sex with me (so I had sex with someone else).	.430		

To justify myself.	.428	
To get to know my personal boundaries.	.421	
I wanted to prove myself to others.	.420	
To prove myself.	.412	
To show my capability.	.396	
I was under the influence of alcohol.	.392	
I wanted to boost my self-esteem.	.390	
It was trendy.	.390	
I wanted to fulfill a need.	.388	
The person was a good dancer.	.385	
I wanted to make my partner jealous.	.377	
I wanted to seek revenge.	.373	
I wanted to keep myself in shape.	.373	
I wanted to demonstrate my power.	.366	
I wanted to control the other person.	.363	
Out of friendship.	.363	
It was a source of inspiration.	.363	
I wanted to infuriate someone.	.360	
I wanted to increase my prestige.	.353	
It was a fling.	.353	-.309
I wanted to punish my partner.	.349	
I didn’t want to be the odd one out.	.349	
Out of a desire for possession.	.348	
I was dissatisfied.	.345	
I was in an altered state of consciousness.	.342	
He/she offered me something in exchange for sex.	.340	
I wanted to record it (sound/picture/video).	.318	
I wanted to feel appreciated.	.314	
Instead of talking.	.308	
It was a bet.		
It was an initiation.		
I was under the influence of porn.		
I wanted to punish a cheater.		
I wanted to experience aggression.		
I wanted to satisfy my masochistic instincts.		
I wanted to humiliate the person.		
I was having midlife anxiety.		
I was under the influence of drugs.		
I wanted to say „Goodbye”.		
I blackmailed him or her / He or she blackmailed me.		
I wanted to lose my virginity.		
Instead of paying or getting paid.		
Out of shame.		
It was a religious ritual.		
Out of mutual appeal.		-.713
The person was desirable/sexy.		-.707
I wanted to please myself.		-.705
I wanted to become one with the other person.		-.681
I was in a romantic mood.		-.662

I wanted the relationship to grow.		-.661	
Out of passion.		-.658	
I wanted pleasure.		-.654	
I wanted to intensify the commitment.		-.650	.348
I wanted to deepen the relationship.		-.640	
Because of sexual desire.		-.630	
I wanted to be attached to the person.		-.624	
I was horny.		-.624	
I wanted to get on the same wavelength as the other person.		-.623	
It was a pleasant pastime.		-.623	
I wanted to satisfy my partner.		-.612	
It was a way to express my feelings.		-.604	
The person had an attractive personality.		-.603	
I wanted to get closer to the person.		-.603	
I wanted to be satisfied.		-.599	
I was in love.		-.597	
I wanted to have an orgasm.		-.593	
I was seeking emotional closeness (i.e., intimacy).		-.575	
I wanted to recharge.		-.573	
I love sex.	.341	-.572	
To seek pleasure.		-.568	
The person was too ‘‘hot’’ (sexy) to resist.		-.554	
Out of affection.		-.553	
I needed it.		-.516	
I wanted to care for the other person.		-.506	.386
The person’s touch was pleasant.		-.492	
The person smelled good.		-.491	
We were made for each other.		-.477	
I wanted to conquer the other person.	.309	-.476	
I wanted to feel restored.		-.469	
The person had an attractive body.	.436	-.453	
I liked the person.		-.452	
I wanted to relax.		-.452	
I wanted to be/feel happy.		-.448	
Out of trust.		-.447	
I wanted to act out a fantasy.	.403	-.444	
I wanted to cheer up the other person.		-.436	.435
I wanted to make my partner happy.		-.435	
It was an inner drive (I couldn’t control myself).	.322	-.424	
I wanted to celebrate.		-.424	
It seemed like the next step in the relationship.		-.419	
I wanted to try out new sexual techniques or positions.	.327	-.418	
I wanted to know how it feels to get acquainted with him or her.		-.411	
It was a special occasion/situation.	.388	-.410	
The person had an attractive voice.		-.398	
I wanted to have sex in an unusual place or situation.	.383	-.389	
Because of commitment.		-.380	.371

I wanted to spiritually merge with the other person.		-.355	
I wanted to express myself.		-.353	
I wanted to reduce stress.		-.349	
I wanted to increase my self-knowledge.	.319	-.320	
I wanted the physical exercise.			
I gave him or her intercourse as a gift.			
I didn’t want to lose the person.			.669
I wanted to avoid a fight/conflict.			.668
I wanted to save the relationship.			.649
Out of duty.			.621
I was afraid that my partner would leave me if I didn’t have sex with him/her.			.597
Out of remorse.			.583
I wanted to manage a conflict.			.576
I wanted to retain the relationship.			.575
I wanted to meet the person’s expectations.			.575
I wanted to express my forgiveness.			.552
I wanted to comfort the other person.			.544
I wanted to appease the other person.			.539
I wanted to improve the relationship.		-.348	.535
I wanted to give in.			.524
Out of habit/routine.			.498
Out of fear.			.484
Out of compassion.			.472
I wanted to soothe myself/my partner.			.465
I wanted comfort.			.462
I wanted support.		-.318	.460
I wanted to avert my partner’s suspicion.			.454
Out of despair.			.437
I wanted to seek safety.			.434
I wanted to decrease sadness.			.431
I wanted to apologize.			.429
I wanted to make peace with the other person.			.420
I wanted to reduce anxiety.			.409
It was marital duty.			.394
I wanted to belong to someone.		-.349	.389
Out of sympathy.			.382
I wanted to distract attention.			.373
Out of gratitude.			.367
I wanted to influence the other person.			.361
I wanted to submit myself.			.361
I wanted to forget about my problems.			.360
It was a favor.			.360
I wanted to improve my mood.			.358
Because I lacked love.			.344
I wanted to benefit from it.			.339
I wanted to decrease my anger.			.334
Due to lack of privacy.			.333
I wanted to decrease loneliness.	.315		.331
It was a way to reach my goal.	.302		.328

I wanted to control the person.	.312	.326
Out of rivalry (to show somebody I'm better than him/her).		.325
Out of boredom.		.320
I wanted to profit from it.		.319
I wanted to prove something to my partner.		.319
Out of envy.		.311
For livelihood.		
For money.		
I wanted to gain financial interest.		
I wanted to escape from the previous relationship.		
I couldn't sleep.		
I wanted to relieve pain.		
I felt estranged from a partner.		
I couldn't say no.		
It was a rebellion against parental rules.		
I was influenced by a movie.		
I hoped it would lead to advancement.		
Due to a threat.		
I wanted to have a child.		
Due to violence.		
For career advancement.		

Note: Factor loadings < .30 have been suppressed

Subfactor Analysis and Scale Construction

Because each of the three factors contained a large (i.e., 60, 56, 49 items for Personal Goal Attainment, Relational Reasons, and Sex as Coping, respectively) and quite heterogeneous number of different reasons, separate PCAs were conducted on items within each of the three broad domains. KMO measures (0.960, 0.973, and 0.957 for Personal Goal Attainment, Relational Reasons, and Sex as Coping, respectively) and Bartlett's Tests of Sphericity (approx. $\chi^2(1770) = 32{,}286.66$, approx. $\chi^2(1540) = 35{,}283.93$, and approx. $\chi^2(1176) = 24{,}965.48$ for Personal Goal Attainment, Relational Reasons, and Sex as Coping, respectively; all ps < 0.001) Using initial eigenvalue = 1 as threshold, PCAs revealed a different number of subfactors within each factor. For Personal Goal Attainment 11 subfactors (accounting for 57.70% of the total variance) emerged, out of which three factors were omitted because of inconsistent item meanings. Factor 6—explaining 2.48% of the total variance—contained items "Instead of talking," "The other person offered himself or herself," "Out of friendship," and "I wanted to keep myself in shape." Factor 9—explaining 1.91% of the total variance—contained items "It was a source of inspiration," "The person was a good dancer," and "To get to know my personal boundaries" with loadings above |.30|. Factor 10—explaining 1.79% of total variance—contained items "I wanted to record it (sound/picture/video)" and "I was dissatisfied" with loadings above |.30|. Thus, the final number of subfactors for Personal Goal Attainment was eight (Table 2).

Table 2 *Subfactor analysis of personal goal attainment for engaging in sexual intercourse*

Item Description	Factor							
	Seeking novelty	Conformity	Infidelity	Impulsiveness	Revenge	Seeking sensation	Control and power	Boosting self-esteem
I wanted new experience.	.502							
I love variety.	.489							
It was forbidden.	.443							
I wanted to get some experience.	.432							
I wanted to experience a desire for freedom.	.430							
Out of curiosity.	.400					-.381		
For the hunt.	.394							
Because I was addicted to sex.	.392							
It was a challenge.	.360							
The other person was acting sexing.	.358							
Because it was fun.	.356							
I wanted to get the other person.	.349							
It was trendy.		.761						
I didn’t want to be the odd one out.		.744						
I wanted to be cool.		.732						
I wanted to show off.		.595						
I wanted to prove myself to others.		.490						
For fun.								

My partner did not want to have sex with me (so I had sex with someone else).		.955			
My partner was not able to have sex with me (so I had sex with someone else).		.878			
My partner is not adventurous enough (so I had sex with someone else).		.853			
Out of infidelity.		.580			
For the excitement of cheating on my partner.	.303	.543			
I was under the influence of alcohol.			.863		
I was in an altered state of consciousness.			.809		
We hooked up in the heat of the moment.			.689		
I needed a one-night stand.			.424		-.361
I wanted to infuriate someone.				.862	
I wanted to take revenge.				.788	
I wanted to make my partner jealous.				.692	
I wanted to punish my partner.				.655	
Instead of talking.					
The other person offered himself or herself.	.313				

Out of friendship.				
I wanted to keep myself in shape.				
I wanted to seek experience.		-.626		
It was a seduction/I was seduced.		-.625		
I took the opportunity.		-.547		
Out of longing for adventure.		-.545		
To discover the unknown.		-.523		
The person had an exotic appearance.		-.483		
I wanted to seek experience.		-.421		
I wanted to control the other person.			.742	
I wanted to demonstrate my power.			.710	
Out of a desire for possession.			.446	
I wanted to increase my prestige.	.350		.411	
He/she offered me something in exchange for sex.	.333		.385	.354
Out of vanity.				
It was a source of inspiration.				
The person was a good dancer.				
To get to know my personal boundaries.				-.334
I wanted to record it (sound/picture/video).				
I was dissatisfied.				
I wanted to fulfill a need.				

To prove myself.	-.632
I wanted to boost my self-esteem.	-.596
I wanted to feel appreciated.	-.518
To justify myself.	-.517
To boost my ego.	-.499
To show my capability.	-.415

Note: Factor loadings < .30 have been suppressed. Items bolded were included in the composite scoring.

For Relational Reasons, 9 subfactors (accounting for 55.47% of the total variance) emerged (Table 3). For Sex as Coping, 8 subfactors (accounting for 54.48% of the total variance) emerged, out of which one factor was omitted because of inconsistent item meanings. Factor 7—explaining 2.56% of total variance—contained items "Out of fear," "Out of remorse," and "I wanted to distract attention" with loadings above |.30|. This left the Sex as Coping factor with seven subfactors (Table 4). One item ("It was marital duty") was omitted because it was deemed as redundant to a more broadly worded item ("Out of duty") with considerably similar factor loading.

Table 3 *Subfactor analyses of relational reasons for engaging in sexual intercourse*

Item Description	Factor							
	Sexual desire	Commitment	Care	Physical attraction	Relaxation	Intimacy	Excitement	Self-affirmation	Happiness seeking
I wanted to have an orgasm.	.810							
Because of sexual desire.	.773							
I wanted pleasure.	.751							
I love sex.	.722							
I wanted to be satisfied.	.712							
I wanted to please myself.	.636							
To seek pleasure.	.565								.302
I was horny.	.522							
I needed it.	.520							
It was a pleasant pastime.	.354							
I wanted to satisfy my partner.	.342							
It seemed like the next step in the relationship.		.693						
I wanted to deepen the relationship.		.644						

I wanted the relationship to grow.		.643							
Because of commitment.		.538							
I wanted to get closer to the person.		.413							
I wanted to be attached to the person.		.402							
I wanted to intensify the commitment.		.395						.371	
It was a way to express my feelings.		.389							
Out of mutual appeal.	.313	.339							
I wanted to care for the other person.			.515						
I wanted to cheer up the other person.			.450						
I wanted to celebrate.			.382				-.335		
The person had an attractive body.				.663					
The person smelled good.				.632					
The person had an attractive personality.				.608					
The person had an attractive voice.				.595					
The person was too ‘‘hot’’ (sexy) to resist.				.415					
I liked the person.			.346	.386					
The person was a desirable/sexy.	.341			.374					
I wanted to know how it feels to get acquainted with him or her.				.344					
I wanted to feel restored.					.791				
I wanted to reduce stress.					.719				
I wanted to recharge.					.678				
I wanted to relax.					.612				
I was in love.						.713			
We were made for each other.						.460			.331
Out of passion.	.367					.448			
Out of affection.			.397			.407			
I was in a romantic mood.						.380			
I wanted to have sex in an unusual place or situation.							-.553		
It was a special occasion/situation.							-.540		
I wanted to try out new sexual techniques or positions.							-.490		
I wanted to act out a fantasy							-.477		
It was an inner drive (I couldn’t control myself).							-.351		

I wanted to conquer the other person.				-.318			
I wanted to spiritually merge with the other person.					.691		
I wanted to express myself.					.568		
To get on the same wavelength with the other person.					.497		
I wanted to increase my self-knowledge.					.446		
I wanted to become one with the other person.				.365	.439		
I was seeking emotional closeness (i.e., intimacy).					.382		
I wanted to make my partner happy.						.738	
I wanted to be/feel happy.						.591	
The touch of the person was pleasant.		.409				.562	
Out of trust.						.457	

Note: Factor loadings < .30 have been suppressed. Items bolded were included in the composite scoring

Table 4 *Subfactor analyses of sex as coping for engaging in sexual intercourse*

Item Description	Factor						
	Mitigating emotional deficit	Compulsion and avoidance	Utilitarianism	Coping with relational conflicts	Submissiveness	Coping with partner's emotional demands	Mate retention
I wanted to decrease loneliness.	.707						
Because I lacked love.	.692						
I wanted to decrease sadness.	.682						
I wanted to improve my mood.	.681						
I wanted comfort.	.648						
I wanted to forget about my problems.	.618						
I wanted support.	.602						
Out of despair.	.566						
I wanted to belong someone.	.539						-.352
I wanted to reduce anxiety.	.535						
Out of boredom.	.403						
I wanted to soothe myself/my partner.	.373						
Due to lack of privacy.							
It was marital duty.		.833					
Out of duty.		.747					
Out of habit/routine.		.684					
I wanted to avert my partner's suspicion.		.381					

I wanted to avoid a fight/conflict.		.376				
I wanted to meet the person's expectations.						
I wanted to profit from it.			.722			
It was a way to reach my goal.			.687			
I wanted to benefit from it.			.627			
I wanted to influence the other person.			.569			
Out of envy.			.552			
Out of rivalry (to show somebody I'm better than him/her).			.372			
I wanted to control the person.	.318		.319			
I wanted to apologize.				-.710		
I wanted to make peace with the other person.				-.702		
I wanted to appease the other person.				-.543		-.319
I wanted to manage a conflict.				-.484		
I wanted to decrease my anger.	.340			-.441		
I wanted to express my forgiveness this way.				-.431		
I wanted to submit myself.					.531	
I wanted to seek safety.	.351				.420	
I wanted to prove sg to my partner.				-.335	.339	
I wanted to give in.					.327	
It was a favor.						.727
Out of sympathy.						.668
Out of gratitude.						.594
Out of compassion.						.550
I wanted to comfort the other person.						.423
Out of fear.						
Out of remorse.						
I wanted to distract attention.	.308					
I wanted to retain the relationship.						-.747
I wanted to save the relationship.						-.701
Not to lose the other person.						-.686
I wanted to improve the relationship.						-.641
I was afraid that my partner would leave me (if I didn't have sex with him/her).					.339	-.488

Note: Factor loadings < .30 have been suppressed. Items bolded were included in the composite scoring.

Subfactors of the *Personal Goal Attainment* factor were labeled as follows: Novelty Seeking, Conformity, Infidelity, Impulsiveness, Revenge, Sensation Seeking, Control and Power, Self-Esteem Boost. Subfactors of the *Relational Reasons* factor were labeled as follows: Sexual Desire, Commitment, Care, Physical Attraction, Relaxation, Intimacy, Excitement, Self-Affirmation, Happiness Seeking. Subfactors of the *Sex as Coping* factor were labeled as follows: Emotional Need Satisfaction, Compulsion and Avoidance, Utilitarianism, Coping with Relational Conflicts, Submission, Dealing with Partner's Emotional Needs, Mate Retention. Within the respective factors, each subfactor was relatively homogeneous in content while considerably distinct from the other subfactors. This suggests that each subfactor taps not only a statistically but a psychologically and functionally distinct category.

Items with a factor loading not greater than 0.30 were removed from each subfactor. For this reason, 14 items were removed from the *Personal Goal Attainment* factor and 4 items from the *Sex as Coping* factor. One item was removed from the *Relational Reasons*factor because the content of the item "For the emotions I feel when discovering a new partner" was deemed inconsistent with the other items of the Physical Attraction subfactor. (see Tables 2, 3, 4).

Internal consistency of the resulting 144-item Hungarian version of the YSEX? (YSEX?-H) was tested by calculating Cronbach's αcoefficients of the subfactors and composite factors for each gender group and for the overall sample (see Supplement 2).

Composite Analysis

Gender differences in sexual motivation In order to assess gender differences in composite scores, the samples of women and men were compared on each factor and subfactor by independent samples *t*-tests. Table 5 shows that significant differences were found between the two samples on some of the factors as well as on some of the subfactors (at three significance levels). A gender difference was found on the *Personal Goal Attainment* factor, on which men scored significantly higher than women ($p < 0.001$). No significant difference was found on the *Relational Reasons*factor (although differences were found on some of the subfactors, which are addressed below). The *Sex as Coping* factor also revealed a significant gender difference, on which women scored higher than men ($p < 0.005$).

Table 5 *Gender differences in 144 items YSEX?-H factor and subfactor scores*

Factor	Subfactor	Women		Men		*t*	*d*
		Mean	SD	Mean	SD		
Personal Goal Attainment		75.30	23.19	83.38	27.17	5.14***	-.31
	Novelty Seeking	22.33	9.18	25.64	1.46	5.36***	-.34
	Conformity	5.72	1.76	6.48	2.63	5.73***	-.34
	Infidelity	6.39	2.66	7.65	3.71	6.51*	-.39
	Impulsiveness	7.02	3.09	7.53	3.19	2.57*	-.16

Revenge	4.75	1.64	4.67	1.65	-.73	.05
Sensation Seeking	13.06	5.02	14.74	5.45	5.06***	-.32
Control and Power	5.28	2.04	5.64	2.47	2.54*	-.16
Self-esteem Boost	1.74	4.89	11.03	5.03	.889	-.06
Relational Reasons	16.79	42.25	156.88	41.67	-1.44	.09
Sexual Desire	38.37	11.06	39.15	1.57	1.10	-.07
Commitment	28.01	8.75	25.13	8.40	-5.16***	.34
Physical Attraction	18.42	6.54	19.59	6.47	2.79*	-.18
Relaxation	9.03	3.98	8.62	3.95	-1.62	.10
Intimacy	17.90	4.57	16.82	4.82	-3.62***	.23
Excitement	14.40	5.30	14.72	5.53	.932	-.06
Self-affirmation	13.94	5.23	12.99	5.17	-2.85**	.18
Care	6.47	2.77	6.12	2.84	-1.95	.12
Happiness Seeking	14.25	3.84	13.75	3.79	-2.00*	.13
Sex as Coping	68.95	21.21	65.64	21.49	-2.41**	.15
Mitigating Emotional Deficit	21.05	8.50	19.46	7.82	-2.96	.19
Compulsion and Avoidance	6.37	2.77	6.10	2.59	-1.58	.10
Utilitarianism	8.57	2.54	8.48	2.66	-.57	.04
Coping with Relational Conflicts	1.22	4.11	9.99	3.94	-.9	.06
Submissiveness	6.85	2.84	6.35	2.63	-2.79*	.18
Coping with Partner's Emotional Demands	6.43	2.11	6.75	2.84	2.11**	-.13
Mate Retention	9.45	4.40	8.52	3.75	-3.43*	.23

Note: Absolute range. 1–5. * p < .05. ** p < .005. *** p < .001

An analysis of men's and women's scores on the subfactors further revealed gender differences in sexual motivation. Men attained a higher mean score on the *Personal Goal Attainment*factor because they scored higher on all of its subfactors where a significant difference was found, namely, on Novelty Seeking, Conformity, Infidelity, Impulsiveness, Sensation Seeking, and Control and Power. The *Relational Reasons* factor revealed no significant gender difference, probably because the significant differences found on five of its subfactors counterbalanced each other. The only subfactor on which men scored significantly higher than women was Physical Attraction ($p < 0.05$). By contrast, women scored higher on the Commitment, Intimacy, Self-Affirmation and Happiness Seeking subfactors ($p < 0.001$, $p < 0.001$, 0.005, and 0.05, respectively). Women's higher mean score on the *Sex as Coping* factor was due to their higher scores on the Submission and Mate Retention subfactors ($p < 0.05$ in both cases), whereas men scored higher on the Dealing with Partner's Emotional Needs subfactor ($p < 0.005$). No significant difference was found on the other four subfactors. Correlations between age and the primary factors and subfactors of YSEX-H are presented in Supplement 3.

Study 3: Short Version, Personality, Sociosexuality

Method

Development of a Short Version

Sample and procedure Respondents were invited through the above-mentioned online platforms to anonymously complete a questionnaire. The online form was available for about a month (from October 10, 2014 to November 8, 2014). Since respondents were reached through the same channels as those used in Studies 1 and 2, it is possible that the samples partly overlapped. A total of 1032 respondents completed the questionnaire. Since only 8 respondents reported never having engaged in sexual intercourse, they were excluded from the sample. Responses of the remaining 1024 respondents were analyzed in Study 3 (age: $M = 33.81$, SD = 10.81, range: 18–80). The sample included 578 women (age: $M = 30.47$, SD = 8.75, range: 18–74) and 446 men (age: $M = 38.14$, SD = 11.66, range: 18–80). We used an adapted version of the Kinsey Scale to assess sexual orientation (e.g., Kinsey et al., 1948, 1953). Details of the scale and descriptive data are presented in Supplement 4.

In Study 3, we collected data from a new sample to develop a short-form Hungarian YSEX questionnaire. This differs from the methodology described by Meston et al. (2019) in the development of the American version of the YSEX?-SF which used the original YSEX? data sample for item selection. The primary consideration underlying the development of the short form of the YSEX?-H questionnaire was that its internal consistency should not fall behind that of the full version (i.e., the Cronbach's α coefficient for each factor and subfactor should be at least 0.60 that is an acceptable cut-off point for scales measuring broad concepts; Hoekstra et al., 2019). To this end, three short forms including 5, 4, and 3 items per subfactor were tested. The general rule of item selection was that the three items having the highest factor loadings within each subfactor should be included in the short form. Since the 3-item subfactors showed adequate internal consistency, these subfactors were included in the short form with one exception. Since the 3-item *Submission* subfactor of the *Sex as Coping* factor did not reach the expected Cronbach's αvalue, all 4 items of this subfactor were included in the short form in order to obtain adequate internal consistency.

The only exception to this rule (apart from the above-mentioned *Submission* subfactor) was the *Dealing with Partner's Emotional Needs* subfactor of the *Sex as Coping* factor. Items of this subfactor in descending order by factor loading were as follows: "It was a favor," "Out of sympathy," "Out of gratitude," "Out of pity," and "I wanted to comfort the other person." However, a subfactor with more consistent contents was obtained when removing the items

referring to sympathy and gratitude than when removing the last two items. All factors and subfactors of the resulting short form showed the expected internal consistency (see Table 6).

Table 6 *Internal consistency of the long version (144 items) and short version (73 items) of the questionnaire and correlations of corresponding scales of the two versions (n = 1161)*

Factor	Subfactor	Long version (144 items) Cronbach alpha	Short version (73 items) Cronbach alpha	*Pearson r*
Personal Goal Attainment		.95	.81	.98**
	Novelty Seeking	.91	.74	.90**
	Conformity	.78	.76	.91**
	Infidelity	.84	.86	.91**
	Impulsiveness	.77	.75	.95**
	Revenge	.76	.75	.97**
	Sensation Seeking	.83	.75	.93**
	Control and Power	.67	.67	.97**
	Self-esteem Boost	.85	.74	.95**
Relational Reasons		.96	.88	.99**
	Sexual Desire	.93	.86	.92**
	Commitment	.86	.79	.88**
	Physical Attraction	.88	.74	.93**
	Relaxation	.82	.81	.97**
	Intimacy	.77	.68	.93**
	Excitement	.81	.72	.90**
	Self-Affirmation	.79	.64	.92**
	Care	.72	.72	1,00***
	Happiness Seeking	.66	.65	.93**
Sex as Coping		.94	.81	.98**
	Emotional Need Satisfaction	.90	.78	.90**
	Compulsion and Avoidance	.73	.66	.97**
	Utilitarianism	.71	.62	.80**
	Coping with Relational Conflicts	.81	.75	.95**
	Submission	.62	.62	.96**
	Dealing with Partner's Emotional Needs	.72	.65	.92**
	Mate Retention	.86	.85	.96**

Note: ** p < .001, *** There were only 3 items in the long version, so the short version is the same.

The item selection procedure used in the present study was similar to that used by Meston et al. (2019) which also relied on factor loadings as a basis for item selection in the development of the American short-form version of the scale. Our methodology differs from Meston et al., however, in that we selected the three highest loading items from each of the 24 subfactors (4 items from the *Submission* subfactor) resulting in a total of 73 items for the YSEX?-HSF;

Meston et al. retained the two highest loading items from each of the 13 subfactors of the full scale YSEX? but made exceptions to select items with lower factor loadings for items that were not considered representative of the overall subscale and changed the wording of some items to be more broadly representative of the construct. Also, two items from an existing subfactor were used to form the basis of a new subscale. The resulting American YSEX?-SF consists of 28 items. It should be noted that the American YSEX?-SF was not published at the time the current study was conducted.

Validation procedure Following the validation procedure used by Meston and Buss (2007), the Sociosexual Orientation Inventory (SOI-R; Penke & Asendorpf, 2008; Hungarian version: Meskó et al., 2014) was administered to respondents in addition to the YSEX?-H questionnaire. Based on the Sexual Strategies Theory (Buss & Schmitt, 1993), we hypothesized that sociosexuality (i.e., openness to having sex in uncommitted relationships) could be associated with sexual motivations. Respondents also completed the 15-item GSOEP Big Five Inventory (BFI-S; Hahn et al., 2012). Based on the association of motivation in general and personality (e.g., Strus & Cieciuch, 2017), we hypothesized that factors of personality could be associated with sexual motivation. Since the BFI-S has not yet been adapted to Hungarian to our knowledge, we prepared a Hungarian translation for the purposes of the present study. Because of well-documented evidence for the cross-cultural invariance of Big Five dimensions (e.g., Salgado et al., 2003), we deemed cultural adaptation of BFI-S unnecessary.

Results

Internal consistency Internal consistency of the scales used in the study was tested by calculating Cronbach's *α* coefficients with the SPSS v23 software. The coefficients obtained for the factors and subfactors of the YSEX?-H are shown in Table 7. The coefficients obtained for the SOI-R were as follows: Global Sociosexual Orientation: 0.86, Sociosexual Behavior: 0.78, Sociosexual Attitude: 0.84, Sociosexual Desire: 0.88. The coefficients obtained for the BFI-S were as follows: Extraversion: 0.69, Neuroticism: 0.73, Agreeableness: 0.44, Conscientiousness: 0.65, Openness: 0.54. According to Gosling et al. (2003), given the brevity of the BFI-S (i.e., three items per scale) and the breadth of the measured dimensions, these Cronbach's α coefficients should raise no concern.

Table 7 *Internal consistency of the 73 item YSEX?-HSF factor and subfactor items used in Study 3 (n = 1024)*

Factor	Subfactor	Cronbach-Alpha
Personal Goal Attainment		.88
	Novelty Seeking	.72

Conformity	.59
Infidelity	.77
Impulsiveness	.79
Revenge	.75
Sensation Seeking	.69
Control and Power	.79
Self-esteem Boost	.75
Relational reasons	.92
Sexual Desire	.81
Commitment	.73
Physical Attraction	.66
Relaxation	.75
Intimacy	.67
Excitement	.69
Self-Affirmation	.53
Care	.62
Happiness Seeking	.63
Sex as coping	.88
Mitigating Emotional Deficit	.75
Compulsion and Avoidance	.61
Utilitarianism	.72
Coping with Relational Conflicts	.78
Submissiveness	.57
Coping with Partner's Emotional Demands	.50
Mate Retention	.82

Note: Internal consistency scores are Cronbach's coefficient alphas.

Confirmatory factor analysis of the short version Confirmatory factor analyses were conducted with the AMOS add-on module for the SPSS v18.0 software in order to corroborate the reliability of the short form. Men's and women's responses were separately analyzed to verify that the reliability of the factor structure was not due to the predominance of women in the sample. The fit between the theoretical model predicting three related factors (see Appendix 1) and the data was tested by the RMSEA index, since the χ^2 test was not informative due to the large sample size, while the relative fit indices were inadequate because the RMSEA of the null model did not reach the critical value of 0.158 (Kenny, 2015). The theoretical model showed acceptable fit both with women's responses ($n = 578$; RMSEA = 0.045 [90% CI = 0.044–0.046]) and with men's responses *(*$n = 446$; RMSEA = 0.058 [90% CI = 0.056–0.060]; Hu & Bentler, 1999). These results confirm that the short form of the YSEX?-H provides a reliable measure of the three distinct types of sexual motivation (i.e. Personal Goal Attainment, Relational Reasons, and Sex as Coping) both in women and men.

The relationship between personality and sexual motivation in each gender group Pearson's correlation coefficients were calculated to test the relationship between the factors of the

Big Five Inventory (BFI-S) and the factors and subfactors of the YSEX?-HSF in each gender group. The results are shown in Table 8. In sum, the factors and subfactors measuring sexual motivation positively correlated with Extraversion, Neuroticism and Openness, while they predominantly showed negative correlations with Agreeableness and Conscientiousness. Extraversion positively correlated with all three factors of the YSEX?-HSF (*Personal Goal Attainment*, *Relational Reasons*, and *Sex as Coping*) and showed the highest total number of significant correlations with sexual motives. Neuroticism showed a significant (positive) correlation with only one factor in the sample of women: those reporting higher levels of emotional instability scored higher on the *Sex as Coping* factor. Agreeableness correlated significantly (negatively) with only one factor: those who reported higher levels of Agreeableness scored higher on the *Personal Goal Attainment*factor. Conscientiousness was also associated (negatively) with only one factor in the male subsample: those judging themselves as more conscientious scored lower on the *Personal Goal Attainment* factor. Openness was positively associated with all three factors of the YSEX?-HSF. The subfactors of sexual motives outlined an even more complex picture (see Table 8).

Table 8 *Pearson's correlations between the 73-item YSEX?-HSF questionnaire and the Big Five Inventory*

Factor / Subfactor	Men					Women				
	E	N	A	C	O	E	N	A	C	O
Personal Goal Attainment	.22 **	.02	-.09	-.09 *	.15 **	.11 **	.07	-.14 **	.02	.10 *
Novelty Seeking	.19 **	-.04	-.06	-.05	.13 **	.15 **	-.05	-.09 *	.08 *	.10 *
Conformity	.07	-.00	-.01	-.09 *	.04	-.01	.06	-.04	.05	.01
Infidelity	.10 *	.04	-.03	-.00	.09 *	.04	-.04	-.08 *	.14 **	.05
Impulsiveness	.18 **	.03	-.13 **	-.15 **	.07	.06	.11 **	-.17 **	-.15 **	.04
Revenge	.11 *	-.05	-.05	-.00	.08	-.02	.06	-.12 **	.10 **	.08
Sensation Seeking	.18 **	-.02	-.05	-.00	.14 **	.15 **	.01	-.12 **	.03	.10 *
Control and Power	.16 **	.07	-.12 **	-.10 *	.09	.05	.07	-.09 *	.03	.08 *
Self-esteem Boost	.16 **	.08	-.01	-.09 *	.13 **	.08	.12 **	.00	-.05	.04
Relational Reasons	.16 **	-.03	.03	.03	.23 **	.17 **	.06	.02	.07	.11 **
Sexual Desire	.11 *	.02	-.01	.03	.13 **	.14 **	.05	-.02	.05	.03
Commitment	.12 *	-.09 *	.01	.07	.09 *	.11 **	.00	.07	.08 *	.06
Physical Attraction	.10 *	-.08	-.02	-.02	.19 **	.10 *	.06	-.03	.04	.13 **
Relaxation	.10 *	.07	.00	-.01	.16 **	.15 **	.01	-.02	-.01	.07
Intimacy	.18 **	-.08	.10 *	.14 **	.25 **	.16 **	.03	.09 *	.11 **	.10 *
Excitement	.12 **	-.04	.04	-.02	.21 **	.10 **	-.05	-.05	.09 *	.12 **
Self-Affirmation	.10 *	.01	.02	-.03	.22 **	.08 *	.10 *	-.01	.01	.10 *
Care	.11 *	.00	-.02	-.03	.11 *	.03	.08	.00	-.04	.01
Happiness Seeking	.10 *	-.02	.11 *	.08	.16 **	.13 **	.08 *	.08	.05	.06
Sex as Coping	.11 *	.02	-.03	-.06	.13 **	.04	.20 **	-.07	-.08	.00
Emotional Need Satisfaction	.05	.12 **	-.05	-.09 *	.11 *	.03	.24 **	-.08	-.09 *	.03
Compulsion and Avoidance	.01	-.02	-.01	-.05	.06	-.05	.07	-.08	-.05	-.05
Utilitarianism	.15 **	-.02	-.00	-.02	.02	.00	.07	-.11 **	.02	.04
Coping with Relational Conflicts	.14 **	-.04	-.00	-.03	.13 **	.09 *	.12 **	-.06	.01	-.02
Submission	.02	.07	-.02	-.03	.07	.05	.16 **	.02	-.09 *	.05
Dealing with Partner's Emotional Needs	.05	-.01	-.04	-.07	.06	-.03	.08 *	-.01	-.03	-.02
Mate Retention	.11 *	-.03	-.00	.01	.12 **	.05	.16 **	-.04	-.08 *	-.01

Notes: * p < .05, ** p< .001. Labels: E = Extraversion, N = Neuroticism, A = Agreeableness, C = Conscientiousness, O = Openness.

The correlations between sexual motives and personality factors showed rather different patterns in the two gender groups. While Extraversion positively correlated with all the three factors in the male subsample, it was only associated with *Personal Goal Attainment* and *Relational Reasons* but not with *Sex as Coping* (nor with any of its subfactors) in the sample of women. Neuroticism only correlated (positively) with *Sex as Coping* among the three factors of the YSEX?-HSF in the sample of women: those women who judged themselves as more unstable reported to be more motivated by reasons related to coping (e.g., Mate Retention, Dealing With Partner's Emotional Needs, Submission, Coping With Relational Conflicts). Agreeableness was not associated with any of the three factors of the YSEX?-HSF in the sample of men, but showed a negative correlation with *Personal Goal Attainment*in the sample of women. Conscientiousness only correlated (negatively) with the *Personal Goal Attainment* factor in the sample of men. Openness showed positive correlations with all three factors in the sample of men, but was only associated with *Relational Reasons* in the sample of women.

Sociosexuality The associations between the global sociosexual orientation index and various sexual motives were tested by calculating Pearson's correlation coefficients for each gender group (see Table 9). Table 9 shows that the same general pattern was obtained for both men and women (positive correlations were found in all cases), but while almost all factors and subfactors of the YSEX?-HSF showed a marked association with sociosexuality in the sample of men, the same held true for only one subfactor of the *Sex as Coping* factor in the sample of women. Sociosexuality showed the only negative correlation with the *Intimacy* subfactor in both gender groups.

Table 9 *Correlations between YSEX?-HSF factors and subfactors and revised sociosexual orientation inventory (SOI-R)*

Factor and Subfactor	Men	Women
Personal Goal Attainment	.53**	.51**
Novelty Seeking	.35**	.35**
Conformity	.22**	.07
Infidelity	.26**	.17**
Impulsiveness	.21**	.26**
Revenge	.13**	.15**
Sensation Seeking	.33**	.33**
Control and Power	.22**	.17**
Self-esteem Boost	.29**	.18**
Relational Reasons	.12**	.02
Sexual Desire	.24**	.11**
Commitment	.01	-.06
Physical Attraction	.16**	.13**
Relaxation	.22**	.12**

Intimacy	-.10*	-.16**
Excitement	.22**	.09*
Self-Affirmation	.05	.04
Care	.12**	-.04
Happiness Seeking	.07	.00
Sex as Coping	.20**	.10**
Mitigating Emotional Deficit	.24**	.21**
Compulsion and Avoidance	.18**	.08*
Utilitarianism	.08	.06
Coping with Relational Conflicts	.09*	.04
Submissiveness	.15**	.07
Coping with Partner's Emotional Demands	.14**	.05
Mate Retention	.07	.05

Note: * p< .05, ** p< .001

The relationship between age and the factors and subfactors of the YSEX?-HSF Spearman's rank correlation coefficients were calculated to test the associations between age and the factors and subfactors of the 73-item YSEX-HSF questionnaire in both subsamples and in the overall sample. Significance was tested at two levels ($p < 0.05$ and $p < 0.001$; see Table 10). In sum, the findings obtained with the short form replicated those obtained with the full version (shown in Table 10). The direction and strength of significant correlations were similar between questionnaires. The three factors of the YSEX-HSF and YSEX-H also showed corresponding correlations: age did not correlate with *Personal Goal Attainment* in either case, but showed a significant negative correlation with *Relational Reasons* and with *Sex as Coping* in both cases.

Table 10 *Spearman's rank correlations (ρ) between age and the factors and subfactors of the YSEX?-HSF questionnaire*

Factor and Subfactor (73 items)	rho		
	Overall (n= 1024)	Women (n= 578)	Men (n=446)
Personal Goal Attainment	.02	-.02	-.05
Novelty Seeking	.07	-.01	.06
Conformity	.44	.07	-.08
Infidelity	.27**	.17**	.26**
Impulsiveness	-.16**	.09*	-.25**
Revenge	-.33	.04	-.07
Sensation seeking	.16	-.3	-.05
Control and Power	-.20	.02	-.09
Self-Esteem Boost	-.67*	-.02	-.1*
Relational Reasons	-.14**	-.1*	-.14**
Sexual Desire	-.14	-.03	.01
Commitment	-.12**	-.02	-.18**
Physical Attraction	.01	-.02	-.03
Relaxation	-.14**	-.08	-.19**
Intimacy	-.14**	-.06	-.11*

Excitement	-.09**	-.12**	-.12*
Self-Affirmation	-.12**	-.07	-.60
Care	-.25**	-.24**	-.23**
Happiness Seeking	-.04	-.02	-.01
Sex as Coping	-.13**	-.10*	-.05
Emotional Need Satisfaction	-.13**	-.06	-.11*
Compulsion and Avoidance	-.01	-.01	.06
Utilitarianism	-.11**	-.07	-.11-
Coping with Relational Conflicts	-.15**	-.13**	-.12*
Submission	-.15**	-.07	-.1*
Dealing with Partner's Emotional Needs	-.02	-.02	.01
Mate Retention	-.05	-.01	.01

Note: * p < .05, ** p < .01

Discussion

To our knowledge, the Hungarian adaptation of the YSEX? questionnaire (Meston & Buss, 2007) is the first adaptation based on population-specific data rather than on a translation of the original questionnaire. The primary aim of the present studies was to develop a questionnaire that tapped into the diversity of sexual motives in the Hungarian population and followed the exact methodology used by Meston and Buss (2007).[Footnote 2] Our findings expand existing knowledge of human sexuality in several respects and contribute to a better understanding of the complexity of sexual motivation. In comparison with the original questionnaire, (1) a different structure was found (while most items were similar); (2) marked gender differences were found in the characteristic patterns of sexual motives; (3) an age effect on sexual motivation was revealed; (4) a short (73-item) form of the questionnaire was developed. These findings are discussed below in detail.

Differences and Similarities Between the Original YSEX? and the YSEX?-H Questionnaires

While the original YSEX? questionnaire (Meston & Buss, 2007) was based on 237 reasons for having sex, development of the YSEX?-H initially revealed 197 distinct reasons (see Study 1). The original YSEX? and the Hungarian adaptation have many items with overlapping or identical content (e.g., "I was seeking experience," "I was under the influence of alcohol," "I was in love"), while other items are only included in one or the other questionnaire (e.g., "I wanted to give someone else a sexually transmitted disease," "The person was intelligent," "I wanted to feel feminine/masculine"). The difference between the two questionnaires in the number of items is mainly due to items that describe age and culture-specific reasons characteristic to young adults (university students), which reasons are generally related to the

psychological problems of the transition from adolescence to adulthood (e.g., “I wanted to feel older,” ”I wanted to defy my parents”).

Differences and Similarities in the Factor Structures

The original YSEX? and the YSEX?-H show a striking difference in the number of factors (4 vs. 3). A certain shift of focus is observable in the three-factor structure of the YSEX?-H (Personal Goal Attainment, Relational Reasons, Sex as Coping) as compared to the four-factor structure of the original YSEX? (Physical Reasons, Goal Attainment, Insecurity, Emotional Reasons) developed by Meston and Buss (2007). Although the two questionnaires list very similar reasons, these reasons seem to be articulated in different ways when examined in the context of the factor structures. The *Personal Goal Attainment* factor of the YSEX?-H partly overlaps the *Physical Reasons* and *Goal Attainment*factors and their subfactors in the original YSEX? questionnaire. For example, an item referring to experimentation is present in both *Personal Goal Attainment* and *Physical Reasons* factors of the two questionnaires (“I wanted to experiment with new experiences” and “I wanted to seek experience,” for YSEX? and YSEX?-H, respectively). At the same time, an item referring to revenge as a motivation for having sex is to be found in both *Personal Goal Attainment* and *Goal Attainment* factors of the two questionnaires (“I wanted to get back at my partner for having cheated on me” and “I wanted to take revenge,” for YSEX? and YSEX?-H, respectively). Furthermore, the *Relational Reasons* and *Sex as Coping* factors of the YSEX?-H are very similar to the *Emotional Reasons* and *Insecurity* factors of the YSEX? questionnaire, respectively. “I realized I was in love” (YSEX?) and “I was in love” (YSEX?-H) are from *Emotional Reasons* and *Relational Reasons* factors, respectively. Meanwhile, “I wanted to say «I’m sorry»” (YSEX?) and “I wanted to apologize.” (YSEX?-H) are from *Insecurity* and *Sex as Coping* factors, respectively.

These comparisons raise the question of whether the observed differences and similarities are due to cultural factors. In our view, the difference between the factor structures is most likely a result of age differences between the samples. A Norwegian study successfully replicated the factor structure of the original YSEX? questionnaire despite the cultural differences between the Norwegian and American respondents (Kennair et al., 2015). However, the Norwegian sample and the American sample both included university students.

Gender Differences and Similarities in Sexual Motivation

The present study revealed robust gender differences in the characteristic patterns of various sexual motives. The observed similarities and differences between men’s and women’s sexual motivation are discussed below.

Similarities Men and women showed more similarities than differences in the most important reasons for having sex (e.g., love, mutual attraction, sexual desire). However, biological sex influences which specific attributes of potential partners elicit the experience of love in men and women (Hendrick et al., 1984; Sprecher & Toro-Morn, 2002). From an evolutionary point of view, this means that gender similarities in sexual motivation are underpinned by aspirations that have sex-specific origins and functions. Thus, the function of romantic or erotic love may be the same for each gender (e.g., strengthening the emotional attachment of a relationship and a sense of belonging), but it is worth clarifying that women and men are triggered by other factors (e.g., Conroy-Beam et al., 2019; Meskó et al., 2021; Schmitt, 2014; Walter et al., 2020). For example, women are more likely to experience love and attraction to dominant high-status men, while men are more likely to feel love and attraction toward physically attractive women (Fletcher et al., 2004). Women tend to associate love with emotional attachment and security, while men are more likely to define love in terms of sexual fidelity and satisfaction (Buss, 2000). This was corroborated by the present study, which found no significant difference between men and women on the *Relational Reasons* factor (e.g., Excitement, Care, Relaxation, Sexual Desire).

Differences The present study revealed a number of marked gender differences in the characteristic patterns of sexual motives. Men primarily attributed their sexual activity to *Personal Goal Attainment* (e.g., Novelty Seeking, Impulsiveness, Infidelity), while women assigned more importance to *Sex as Coping* (e.g., Submission, Mate Retention). Gender differences in sexual motivations can be explained by several theoretical perspectives. According to social scripting theory (e.g., Gagnon, 1990; Wiederman, 2005), in Western cultures, scripts for sexual activity are markedly different for men and women. Social sexual scripts can be seen as a type of social agents that prescribe what counts as normative within a culture, thus providing guidance on how to feel, think, and behave in a given situation. Wiederman (2005) argues that the higher number of casual sexual partners reported by men—as compared to women—in self-reported questionnaires is the result of social sexual scripts. In other words, masculinity expectations position having many sexual partners as an achievement for men. Among the psychological mechanisms underlying gender differences in openness to casual sex, Conley (2011) highlights the importance of pleasure.

According to the pleasure theory (Abramson & Pinkerton, 2002), the pursuit of sexual pleasure is the central basis of human sexual motivation (and not the desire to reproduce). In this context, Conley (2011) emphasized that casual sexual contact with a man is likely to be less enjoyable for a woman than vice versa. Interpersonal factors directly related to the

relationship may also have an effect on women and men reporting different sexual motivations in research. According to the literature on sexual coercion (e.g., Livingston et al., 2004; Struckman-Johnson, 1988) women—as compared to men—are more likely to have partners who threaten to break up with them if they do not have sex. In addition to proximal (direct) explanations describing the effects of social variables on sexual behavior and motivations, we should also address possible ultimate (evolutionary) explanations for gender differences.

A plausible explanation for the gender differences in various sexual motives and mate preferences is offered by the *parental investment theory* proposed by Trivers (1972). In the animal kingdom, females and males make unequal contributions to parental investment expressed in the time and energy allocated to each offspring. Individuals of the sex investing less time and energy in parenting allocate more resources to mating with individuals of the opposite sex. The former sex is more aggressive and reaches maturity later than the opposite sex, while it has a lower life expectancy, and its behavior is generally more energetic, active, and dynamic. This sex is less selective in mating: it aims to access as many mates as possible by investing as little time and energy as possible. In most species, this strategy is followed by males. Females invest more in producing offspring, which is especially true for species with internal fertilization such as mammals. This model is clearly consistent with the finding that men are more likely to engage in short-term non-committed sexual relationships than women. Trivers' theory has been supported by several empirical studies (e.g., Buss & Schmitt, 1993). As was the case in the present study, other studies also found greater gender differences in sexual motivation than those obtained by Meston and Buss (Gouvernet et al., 2017; Kennair et al., 2015; Meston & Buss, 2007).

The Impact of Age on Sexual Motivation

The present study found that older people generally scored lower on sexual motives than did younger people, which suggests the importance and function of sexual activity in an intimate partner relationship may change over time. Keeping in mind that desire to engage in sex is only one category of sexual motivation, the finding of a decline in sexual motivation in older versus younger persons is consistent with the well-documented decline in sexual desire seen with age in both men and women (e.g., Hatfield & Rapson, 2015; Höglund et al., 2014; Loe, 2012), and with the related decline in testosterone with age (Dick et al., 2020; Krapf & Simon, 2017; Maggi et al., 2020). However, it should be noted that the relationship between testosterone and sexual desire is not yet completely clear (e.g., van Anders, 2012). The finding of a decrease in sexual motives with age is in striking contrast with the finding on the importance of infidelity at different ages. While younger people reported being primarily responsive to

Physical Attraction, Intimacy and Care, that is, to *Relational Reasons*, older people were more motivated by *Personal Goal Attainment* (e.g., Infidelity), which may be considered a manifestation of their desire for sexual variety. These findings are in line with those reported by Wyverkens et al. (2018), who administered the original YSEX? questionnaire to an older sample and drew similar conclusions.

Personality and Sexual Motivation

The factors of the YSEX?-HSF showed a more complex pattern of associations with the Big Five personality factors than that seen in the original U.S. study (Meston & Buss, 2007). The present study revealed a positive relationship between Extraversion and sexual motivation, which is consistent with the findings of several previous studies (e.g., Gangestad & Simpson, 2000; Jonason et al., 2016; Schmitt, 2004). Neuroticism and sexual motivation also showed a positive association (among women), which corroborates findings of previous studies (Allen & Walter, 2018; Pinkerton & Abramson, 1996; Trobst et al., 2002). Agreeableness and Conscientiousness were negatively associated with the Personal Goal Attainment subfactors of sexual motivation. This finding is highly similar to that reported by Schmitt (2004), who found that sexual promiscuity and infidelity was universally associated with low Agreeableness and low Conscientiousness. All three subfactors of the YSEX?-HSF showed a positive relationship with Openness, which is in line with the finding reported by Schmitt and Shackelford (2008), who revealed a positive association between Openness and short-term mating. Another related finding was reported by Moyano and Sierra (2013), who revealed that openness to experience was negatively associated with negative sexual cognitions. The associations revealed between the YSEX?-HSF and the Big Five personality factors are highly consistent with previous findings on the relationship between sexual motivation and personality.

As compared to the original YSEX? questionnaire, the YSEX?-HSF revealed more pronounced associations between sexual motivation and personality. This may be due to differences between studies in sample characteristics, with the Hungarian studies including older, more mature adults as opposed to university students.

Conclusions

To our knowledge, the YSEX?-HSF is the first national adaptation of the YSEX? questionnaire whose development was based on motives reported by a national sample as opposed to a translation of the original questionnaire. The YSEX?-HSF is a reliable measure with good predictive validity, which confirmed the major expected associations of sexual motivation with both sociosexuality and the Big Five personality factors. Furthermore, the YSEX?-HSF

revealed marked gender and age differences in sexual motivation. The YSEX?-HSF showed a factor structure different from that of the original American version of the questionnaire: the former is composed of three primary factors comprising 24 subfactors; the latter consists of four primary factors and 13 subfactors. Despite the differences between factor structures, the composition of reasons for having sex is highly similar in the two factors. This finding points to both the cross-cultural universality of human sexual motivation, and also the cultural diversity reflected in the differences between the two factor structures. The YSEX?-HSF questionnaire is presented in Supplement 5.

There are a number of study limitations that warrant mention. First, the self-report methodology used in the present studies was based on the assumption that respondents had conscious access to their sexual motives, which is not necessarily true in all cases. Second, data obtained with self-report measures might be distorted by social desirability effects: respondents might suppress socially undesirable responses (e.g., having sex with someone to punish the partner, giving sex for money, etc.), whereas they might show a bias toward socially desirable responses (e.g., having sexual contact to express positive emotions toward the partner, being driven by love, etc.). Furthermore, respondents might be motivated to present themselves in accordance with gender stereotypes. As a consequence, men might have chosen responses that depicted them as sexually more active, more potent or more masculine than they actually were, while women might have suppressed these same responses. Third, although the samples used in the studies were large and relatively heterogeneous, they were not necessarily representative. For example, the samples may not have included asexual respondents, who are likely to be uninterested in a study on sexual motivation.

Notes

1. The first primary factor is *Physical reasons*, which comprises four subfactors: *Stress Reduction* (e.g., “I thought it would relax me”), *Pleasure* (e.g., “I wanted to experience the physical pleasure”), *Physical Desirability* (e.g., “The person’s physical appearance turned me on”), and *Experience Seeking*(e.g., “I was curious about sex”). The second primary factor is *Goal Attainment Reasons*, which also included four subfactors: *Resources* (e.g., “I wanted to get a job”), *Social Status* (e.g., “I wanted to be popular”), *Revenge* (e.g., “I wanted to make someone else jealous”), and *Utilitarian* (e.g., “I wanted to burn calories”). The third primary factor is *Emotional Reasons*, which included two subfactors: one is *Love and Commitment*(e.g., “I wanted to become one with another person”), the other is *Expression* (e.g., “I wanted to say “I’m sorry”). The fourth primary factor is *Insecurity Reasons* comprising three subfactors*: Self-Esteem Boost*

(e.g., “I wanted to feel powerful”), *Duty/Pressure* (e.g., “I didn’t want to disappoint the person”), and *Mate Guarding* (e.g., “I wanted to prevent a breakup”). The study involved 1549 university students (mostly aged 18 to 22). The specificity of this sample possibly restricts the validity of the findings, since it is uncertain whether the questionnaire may be used in its original form to assess older age groups’ sexual motivation.

2. Items of YSEX?-H are available in Table 1. The full formatted version of the questionnaire is available from the corresponding author.

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Contributions

Conceptualization was contributed by NM, DS, AL. Methodology was contributed by NM, DS. Formal analysis and investigation were contributed by AL. Writing—original draft preparation, was contributed by NM. Writing—review and editing, was contributed by CMM,

DMB. Funding acquisition was contributed by NM. Resources were contributed by NM, AL. Supervision was contributed by NM.

ETHICS DECLARATIONS

Conflict of interest

The authors declare that they have no conflict of interest.

Ethical Approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the United Ethical Review Committee for Research in Psychology under Reference No. 2017/21 and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

Supplementary Materials

Supplement 1 *The most and least frequent reasons for having sexual intercourse (1/A and 1/B), and the gender differences in the causes leading to intercourse (1/C)*

The most frequent reasons leading respondents to have sexual intercourse were as follows: (1) I was in love, (2) I enjoy having sex, (3) out of hedonism, (4) out of mutual attraction, (5) to please myself, (6) to feel happy, (7) to satisfy my partner, (8) out of sexual desire. Table 1 shows which 50 of the 197 reasons had the highest importance in having sexual contact (intercourse) within each gender group. Table 1 reveals that men's and women's most important reasons largely overlapped: they had 8 of the top 10 reasons and 22 of the top 25 reasons in common.

Supplement 1/A *Top 50 reasons why men and women have sex*

Item	Women		Item	Men	
	M	SD		M	SD
1. I was in love.	4.13	1.40	I love sex.	4.01	1.24
2. Out of mutual appeal.	3.90	1.18	To seek pleasure.	3.98	1.20
3. To seek pleasure.	3.89	1.25	I was in love.	3.95	1.18
4. I wanted to make my partner happy.	3.84	1.22	Because of sexual desire.	3.91	1.23
5. Because of sexual desire.	3.83	1.23	I wanted to satisfy my partner.	3.87	1.28
6. I wanted to please myself.	3.79	1.26	I wanted to please myself.	3.87	1.22
7. I love sex.	3.78	1.30	Out of mutual appeal.	3.76	1.20
8. Out of passion.	3.70	1.27	I wanted to be/feel happy.	3.65	1.35
9. I wanted to satisfy my partner.	3.65	1.27	The person was a desirable/sexy.	3.59	1.20
10. I wanted to be/feel happy.	3.64	1.34	I wanted pleasure.	3.57	1.25
11. The touch of the person was pleasant.	3.58	1.31	Out of affection.	3.48	1.34
12. The person was a desirable/sexy.	3.55	1.27	I wanted to have an orgasm.	3.47	1.35
13. Out of affection.	3.53	1.36	The touch of the person was pleasant.	3.47	1.36
14. I wanted pleasure.	3.49	1.30	Out of passion.	3.45	1.34
15. I wanted to be satisfied.	3.45	1.34	I wanted to be satisfied.	3.35	1.38
16. I wanted to have an orgasm.	3.44	1.37	I was horny.	3.26	1.33
17. I was horny.	3.38	1.37	The person had an attractive body.	3.12	1.27
18. I wanted to become one with the other person.	3.27	1.41	The person was too "hot" (sexy) to resist.	3.08	1.29
19. It was a way to express my feelings.	3.22	1.41	I wanted to become one with the other person.	3.07	1.42

20. I wanted the relationship to grow.	3.21	1.41	It was a way to express my feelings.	3.06	1.40
21. I wanted to be attached to the person.	3.20	1.40	I wanted the relationship to grow.	3.04	1.42
22. We were made for each other.	3.12	1.43	We were made for each other.	2.99	1.40
23. I was in a romantic mood.	3.10	1.23	I was in a romantic mood.	2.94	1.22
24. The person was too "hot" (sexy) to resist.	3.09	1.34	I needed it.	2.93	1.33
25. I wanted to deepen the relationship.	3.07	1.37	It was a pleasant pastime.	2.92	1.33
26. Out of trust.	3.03	1.54	I wanted to seek experience.	2.92	1.27
27. It was a pleasant pastime.	2.99	1.36	The person had an attractive personality.	2.90	1.28
28. I needed it.	2.91	1.33	I wanted to deepen the relationship.	2.87	1.36
29. The person had an attractive personality.	2.90	1.32	I wanted to be attached to the person.	2.74	1.40
30. I wanted to intensify the commitment.	2.84	1.38	It seemed like the next step in the relationship.	2.71	1.34
31. I wanted to get closer to the person.	2.78	1.31	It was a seduction/I was seduced.	2.65	1.20
32. It seemed like the next step in the relationship.	2.75	1.36	I wanted to act out a fantasy.	2.62	1.26
33. I wanted to seek experience.	2.68	1.31	I liked the person.	2.60	1.29
34. It was a seduction/I was seduced.	2.63	1.23	I wanted to conquer the other person.	2.60	1.30
35. I was seeking emotional closeness (i.e., intimacy).	2.63	1.32	Out of trust.	2.59	1.47
36. To get on the same wavelength with the other person.	2.62	1.36	I wanted to get closer to the person.	2.57	1.28
37. I wanted to recharge myself.	2.60	1.35	I took the opportunity.	2.54	1.14
38. I wanted to conquer the other person.	2.60	1.31	I wanted to intensify the commitment.	2.52	1.31
39. The person had an attractive body.	2.59	1.33	I was seeking emotional closeness (i.e., intimacy).	2.49	1.29
40. I wanted to act out a fantasy.	2.53	1.28	I wanted to satisfy a deficit.	2.47	1.25
41. Out of impulse.	2.52	1.21	I wanted a new experience.	2.47	1.15
42. I liked the person.	2.44	1.34	Out of impulse.	2.46	1.10
43. It was a special occasion/situation.	2.42	1.18	The person offered herself/himself.	2.46	1.13
44. I wanted to have sex in an unusual place or situation.	2.40	1.19	I wanted to have sex in an unusual place or situation.	2.45	1.16
45. It was an inner drive (I couldn't control myself).	2.37	1.33	I love variety.	2.44	1.35
46. The person smelled good.	2.37	1.29	It was a special occasion/situation.	2.43	1.15
47. I wanted to satisfy a deficit.	2.34	1.26	To get on the same wavelength with the other person.	2.42	1.30
48. I took the opportunity.	2.30	1.21	Out of curiosity.	2.41	1.20
49. I wanted a new experience.	2.27	1.15	The person smelled good.	2.39	1.27

50.	Out of curiosity.	2.27	1.16	I wanted to recharge myself.	2.39	1.28

Note: Absolute range 1–5, n = 820 for women; n = 341 for men

Supplement 1/B *The 50 most infrequent reasons why men and women have sex*

Supplement 1/B shows which 50 of the 197 reasons had the lowest importance in having sexual contact (intercourse) within each gender group. Men's and women's least important reasons also largely overlapped (43 of the 50 reasons were common). It is difficult to consistently sort these reasons into a small number of meaningful categories, but generally 5 major themes seem to emerge. The first theme is social conformity or pressure (e.g. 'I did not want to be odd man out'). The second theme is exerting pressure on the partner (e.g. 'to have control over the partner'). The third theme is obtaining resources in return for sex (e.g. money, career progress, benefits). The fourth theme is engaging in sexual activity in response to threat (e.g. violence, blackmailing). The fifth theme is punishing the current or absent partner (e.g. 'to humiliate the partner'; 'to take revenge').

Item	Women		Item	Men	
	M	SD		M	SD
1. For career advancement.	1.02	.16	For livelihood.	1.02	.13
2. Due to religious ritual.	1.02	.21	Due to religious ritual.	1.02	.16
3. For livelihood.	1.03	.25	For career advancement.	1.02	.19
4. Instead of paying or getting paid.	1.03	.26	Due to violence.	1.04	.27
5. Out of shame.	1.03	.23	Due to a threat.	1.04	.31
6. For money.	1.05	.31	Out of shame.	1.05	.24
7. Due to a threat.	1.05	.30	For money.	1.05	.33
8. For profit.	1.05	.33	Instead of paying or getting paid.	1.05	.30
9. I blackmailed him or her / He or she blackmailed me.	1.06	.33	For profit.	1.06	.38
10. Out of envy.	1.06	.35	I blackmailed him or her / He or she blackmailed me.	1.07	.35
11. Due to violence.	1.07	.34	Out of fear.	1.07	.37
12. I wanted to humiliate the person.	1.08	.35	Out of envy.	1.08	.44
13. I wanted to gain financial interest.	1.08	.42	I wanted to gain financial interest.	1.10	.44
14. I was a bet.	1.09	.38	I wanted to benefit from it.	1.10	.44
15. I wanted to benefit from it.	1.10	.44	I wanted to satisfy my masochistic instincts.	1.11	.42
16. It was trendy.	1.11	.43	I was a bet.	1.13	.40
17. I wanted to punish my partner.	1.11	.44	I wanted to humiliate the person.	1.13	.42
18. I was under the influence of drugs.	1.11	.44	I hoped it would lead to advancement.	1.13	.57
19. I hoped it would lead to advancement.	1.12	.53	It was a rebellion against parental rules.	1.13	.47
20. He/she offered me something in exchange for sex.	1.12	.50	I wanted to punish a cheater.	1.13	.46

21. I wanted to show off.	1.13	.50	I was under the influence of drugs.	1.15	.54
22. Out of fear.	1.13	.49	I wanted to infuriate someone.	1.15	.48
23. I wanted to increase my prestige.	1.14	.51	It was trendy.	1.16	.53
24. I was having midlife anxiety.	1.15	.55	I wanted to punish my partner.	1.16	.50
25. I wanted to infuriate someone.	1.16	.48	I wanted to take revenge.	1.18	.58
26. It was a favor.	1.16	.51	I wanted to make my partner jealous.	1.18	.53
27. I wanted to punish a cheater.	1.16	.52	I wanted to experience aggression.	1.19	.61
28. It was an initiation.	1.17	.54	Due to rivalry (to show someone I'm better than a certain someone).	1.19	.50
29. As a jape.	1.17	.53	He/she offered me something in exchange for sex.	1.20	.67
30. I wanted to be cool.	1.17	.56	I wanted to show off.	1.21	.54
31. I wanted to satisfy my masochistic instincts.	1.18	.58	Out of compassion.	1.22	.60
32. I didn’t want to be the odd one out.	1.20	.56	I wanted to demonstrate my power.	1.23	.67
33. Out of compassion.	1.21	.54	Out of remorse.	1.24	.63
34. Due to rivalry (to show someone I'm better than a certain someone).	1.22	.60	As a jape.	1.25	.64
35. It was a rebellion against parental rules.	1.22	.65	It was a favor.	1.25	.64
36. I wanted to take revenge.	1.22	.63	I wanted to increase my prestige.	1.26	.70
37. I wanted to demonstrate my power.	1.22	.65	It was a way to reach my goal.	1.26	.65
38. My partner was not able to have sex with me (so I had sex with someone else).	1.23	.66	I didn’t want to be the odd one out.	1.26	.67
39. I wanted to experience aggression.	1.23	.63	It was an initiation.	1.27	.69
40. I wanted to make my partner jealous.	1.23	.59	I wanted to give in.	1.29	.73
41. I wanted to record it (sound/picture/video).	1.23	.60	I wanted to reduce anxiety.	1.30	.72
42. It was a way to reach my goal.	1.25	.62	I wanted to be cool.	1.30	.72
43. My partner is not adventurous enough (so I had sex with someone else).	1.28	.75	I wanted to submit myself.	1.31	.76
44. My partner did not want to have sex with me (so I had sex with someone else).	1.29	.77	I was afraid that my partner would leave me (if I didn’t have sex with him/her.	1.32	.66
45. Out of remorse.	1.30	.68	I wanted to decrease my anger.	1.32	.74
46. I wanted to avert my partner’s suspicion.	1.30	.69	I wanted to control the other person.	1.32	.74
47. I wanted to reduce anxiety.	1.31	.70	Out of despair.	1.33	.71
48. I wanted to control the other person.	1.31	.71	I wanted to influence the other person.	1.33	.75

49. Out of gratitude.	1.34	.76	I wanted to express my forgiveness this way.	1.34	.65
50. I wanted to prove myself to others.	1.34	.78	I was having midlife anxiety.	1.34	.80

Note: Absolute range. 1–5. n = 820 for women; n = 341 for men.

Supplement 1/C *Gender differences in the causes leading to intercourse are ranked according to Cohen's d value, from the most characteristic of men, to the most characteristic of women*

Item-level gender differences were analyzed by conducting 197 independent samples *t*-tests at a conservative significance level ($p < .005$). Of the 197 items, 64 (32%) showed significant gender differences. Men scored higher on two thirds (42) of these items and women on one third (22) of them. Detailed results of the statistical tests (*t* values, means, standard deviations, Cohen's *d* coefficients) are shown in Supplement 1/C.

Item	Women		Men		*t*	*d*
	M	SD	M	SD		
The other person offered himself or herself.	1.79	1.10	2.46	1.13	9.42	-.60
The person had an attractive body.	2.37	1.29	3.12	1.27	9.09	-.59
The person had an exotic appearance.	1.44	.86	1.97	1.14	8.74	-.53
The other person was acting sexing.	1.61	.98	2.12	1.12	7.76	-.49
I was having midlife anxiety.	1.07	.36	1.34	.81	7.77	-.43
My partner is not adventurous enough (so I had sex with someone else).	1.18	.62	1.52	.96	7.35	-.42
Because I was addicted to sex.	1.46	.97	1.91	1.24	6.60	-.40
I wanted to prove myself to others.	1.25	.66	1.55	.97	5.97	-.36
Out of friendship.	1.43	.80	1.74	1.05	5.61	-.33
For the hunt.	1.66	1.05	2.03	1.19	5.22	-.33
I needed a one-night stand.	1.78	1.04	2.14	1.19	5.15	-.32
I wanted the excitement of cheating on my partner.	1.34	.70	1.62	1.00	5.49	-.32
I love variety.	2.03	1.21	2.44	1.35	5.08	-.32
My partner did not want to have sex with me (so I had sex with someone else).	1.22	.68	1.48	.93	5.30	-.32
I wanted to increase my prestige.	1.09	.41	1.26	.70	4.99	-.30
I wanted to be cool.	1.12	.47	1.3	.72	5.12	-.29
I took the opportunity.	2.2	1.22	2.54	1.14	4.41	-.29
I wanted to record it (sound/picture/video).	1.18	.49	1.36	.80	4.83	-.27
It was forbidden.	1.69	1.05	1.98	1.11	4.27	-.27
I wanted to seek experience.	2.58	1.31	2.92	1.27	4.04	-.26
I love sex.	3.68	1.32	4.01	1.24	3.94	-.26
I wanted to have a child.	1.52	1.02	1.8	1.15	4.10	-.26
I wanted to discover the unknown.	2.06	1.14	2.36	1.24	3.94	-.25
I wanted to show off.	1.09	.41	1.21	.54	3.80	-.25

To prove myself.	2.02	1.20	2.33	1.30	3.90	-.25
I wanted a new experience.	2.19	1.14	2.47	1.15	3.75	-.24
I wanted to satisfy my partner.	3.56	1.26	3.87	1.28	3.86	-.24
I wanted to make my partner happy.	3.75	1.24	4.04	1.17	3.69	-.24
It was an initiation.	1.13	.46	1.27	.69	4.04	-.24
I couldn't say no.	1.47	.86	1.7	1.06	3.83	-.24
It was a favor.	1.12	.45	1.25	.64	3.86	-.24
It was a challenge.	1.66	1.01	1.91	1.14	3.70	-.23
My partner was not able to have sex with me (so I had sex with someone else).	1.18	.60	1.34	.78	3.81	-.23
Out of infidelity.	1.48	.86	1.69	.98	3.59	-.23
I wanted to try out new sexual techniques or positions.	2.1	1.15	2.36	1.18	3.43	-.22
Instead of talking.	1.45	.77	1.64	1.02	3.49	-.21
I wanted to get the other person.	1.97	1.16	2.22	1.30	3.23	-.20
As a jape.	1.14	.47	1.25	.64	3.19	-.20
I wanted to keep myself in shape.	1.43	.90	1.62	1.06	3.12	-.19
I wanted to humiliate the person.	1.06	.31	1.13	.42	2.92	-.19
It was marital duty.	1.67	1.14	1.89	1.20	2.89	-.19
The person was a good dancer.	1.38	.81	1.54	.91	2.95	-.19
He/she offered me something in exchange for sex.	1.1	.40	1.2	.67	3.18	-.18
I was under the influence of porn.	1.9	1.02	2.09	1.09	2.91	-.18
I wanted to become one with another.	3.35	1.40	3.07	1.42	-3.07	.20
It was a rebellion against parental rules.	1.25	.71	1.13	.47	-2.96	.20
I wanted to feel loved.	1.97	1.17	1.74	1.07	-3.10	.21
I wanted to belong someone.	2.23	1.33	1.97	1.18	-3.13	.21
I wanted to feel connected to the person.	2.7	1.38	2.42	1.30	-3.27	.21
Due to care.	2.33	1.26	2.07	1.24	-3.18	.21
Due to deepening the relationship.	3.16	1.36	2.87	1.36	-3.23	.21
I was in love.	4.2	1.12	3.95	1.18	-3.36	.22
I wanted to recharge myself.	2.69	1.36	2.39	1.29	-3.51	.23
I didn't want to ''lose'' the person.	1.85	1.05	1.62	.95	-3.50	.23
I wanted to get closer to the person.	2.87	1.31	2.57	1.29	-3.58	.23
I wanted to balance my mind.	2.01	1.10	1.76	.99	-3.64	.24
It was passion.	3.8	1.22	3.45	1.34	-4.39	.27
I wanted to find support.	1.81	1.07	1.5	.92	-4.59	.31
I wanted to intensify my relationship.	2.97	1.38	2.52	1.31	-5.22	.33
Due to commitment.	2.33	1.46	1.86	1.24	-5.15	.35
Due to safety seeking.	2.01	1.26	1.61	1.01	-5.27	.35
I was afraid my partner would leave me.	1.64	.94	1.32	.66	-5.85	.39
Due to trust.	3.22	1.54	2.59	1.47	-6.48	.42
Due to badinage.	3.38	1.36	2.74	1.40	-7.25	.46

Note: Absolute range. 1–5, * p< .005

Supplement 2 *Internal consistency of the 144 item YSEX?-H*

Coefficients of the composites varied between .94 and .96 in each of the male, female and overall samples, which indicates high internal consistency. At the subfactor level in the overall sample, coefficients varied between .67 and .91 within the *Personal Goal Attainment* factor, between .62 and .93 within the *Relational Reasons* factor, and between .62 and .91 within the *Sex as Coping* factor. In the male sample, coefficients of the subfactors varied between .61 and .92, while they varied between .62 and .92 in the female sample.

Fac-tor	Subfactor	Number of items	Com-bined N=1161	Men N=341	Women N=820
Personal Goal Attainment		46	.95	.95	.94
	Novelty seeking	12	.91	.91	.90
	Conformity	5	.78	.80	.75
	Infidelity	5	.84	.85	.82
	Impulsiveness	4	.77	.76	.77
	Revenge	4	.76	.79	.74
	Sensation Seeking	4	.83	.84	.81
	Control and Power	6	.67	.73	.63
	Self-Esteem Boost	6	.85	.86	.84
Relational Reasons		55	.96	.96	.96
	Sexual Desire	11	.93	.92	.92
	Commitment	9	.88	.87	.88
	Physical Attraction	7	.85	.86	.84
	Relaxation	4	.82	.79	.81
	Intimacy	5	.77	.83	.76
	Excitement	6	.81	.84	.79
	Self-Affirmation	6	.79	.80	.79
	Care	3	.72	.71	.71
	Happiness Seeking	4	.62	.66	.67
Sex as Coping		43	.94	.94	.94
	Mitigating Emotional Deficit	12	.91	.90	.90
	Compulsion and Avoidance	4	.73	.74	.72
	Utilitarianism	7	.71	.74	.69
	Coping with Relational Conflicts	6	.81	.74	.78
	Submissiveness	4	.62	.61	.62
	Dealing with Partner's Emotional Demands	5	.72	.82	.64
	Mate Retention	5	.86	.81	.88

Note: Internal consistency scores are Cronbach's coefficient alphas.

Supplement 3 *Spearman's rank correlations (ρ) between age and the factors and subfactors of the YSEX?-H questionnaire*

Correlations between age and the factors and subfactors of YSEX-H were tested by calculating Spearman's rank correlation coefficients for each gender group and for the overall

sample (significance was tested at $p < .05$ and $p < .01$; see Table 10). The results revealed a characteristic pattern of correlations between age and the factors and subfactors. Various sexual motives generally showed (weak) negative correlations with age, except the Infidelity subfactor, which showed a positive correlation. The Personal Goal Attainment factor did not correlate significantly with age in the overall sample (while these two variables showed a significant negative correlation in each gender group) probably because the negative correlations obtained for Impulsiveness and Self-Esteem Boost counterbalanced the positive correlation obtained for Infidelity. All subfactors of the Relational Reasons factor showed a significant negative correlation with age in the overall sample. Although the Sex as Coping factor showed a significant negative correlation with age in the overall sample, no significant correlation was found between these two variables in either gender group. Moreover, significant (weak) negative correlations for some of the subfactors were found in the female subsample (Emotional Need Satisfaction, Coping with Relational Conflicts), and (Utilitarianism, Submission) in the male subsample.

Factor and Subfactor (144 items)	ρ		
	Overall (n=1161)	Women (n=820)	Men (n=341)
Personal Goal Attainment	-.05	-.11*	-.15**
Novelty Seeking	-.037	-.11*	-.14**
Conformity	.00	-.04	-.12*
Infidelity	.25**	.20**	.18**
Impulsiveness	-.11**	-.13**	-.20**
Revenge	.01	.04	.01
Sensation Seeking	-.06*	-.14**	-.12*
Control and Power	-.06*	-.07*	-.18**
Self-Esteem Boost	-.11*	-.11**	-18**
Relational Reasons	-.18**	-.16**	-.22**
Sexual Desire	-.12**	-.13**	-.22**
Commitment	-.19**	-.13*	-.17**
Physical Attraction	-.12**	-.18**	-.16**
Relaxation	-.18**	-.15**	-.21**
Intimacy	-.14**	-.10*	-.13*
Excitement	-.14**	-.16**	-.17**
Self-Affirmation	-.09**	-.04	-.11*
Care	-.25**	-.24**	-.25**
Happiness Seeking	-.13**	-.12*	-.12*
Sex as Coping	-.09**	-.05	-.09
Mitigating Emotional Deficit	-.11**	-.07*	-.09
Compulsion and Avoidance	.01	.03	-.05
Utilitarianism	-.08**	.03	-.15**
Coping with Relational Conflicts	-.11*	-.09**	-.11
Submission	-.10**	-.05	-.12*

Dealing with Partner's Emotional Needs	.02	-.04	.02
Mate Retention	-.03	.01	.04

Note: * p < .05, ** p < .001

Supplement 4 *Descriptive data and the adapted version of the Kinsey Scale*

The distribution of relationship statuses in the sample was as follows: currently single: 2.7% (women: 3.5%, men: 1.8%), casual sexual contacts without a permanent relationship: 13.0% (women: 13.3%, men: 12.6%), dating someone (but not living together): 7.3% (women: 8.1%, men: 6.3%), domestic partnership: 20.1% (women: 22.7%, men: 16.8%), married: 30.2% (women: 34.1%, men: 25.1%). The 'other, specifically' response category was selected by 26.7% (women: 18.3%, men: 37.4%). These respondents described specific statuses such as 'I am currently dating a woman with two kids, she is 37 and has still not got divorced, I think our relationship will never go deeper'; 'I am still married, unable to get divorced, living with someone else for one and a half years'; 'I lived together with someone from whom I have moved away, but whom I am still intimately attached to, although I have sex with others and not with him'; 'having a friend with benefits'; 'going to be married in two months'; 'I am a lover'; 'an intense emotional and sexual affair going on for long but as an open relationship – we do not live together, and we both date others at night'.

Respondents had been in their current relationship for 70.07 months on average (SD = 94.35, range: 1-612). Women had been in their current relationship for 51.46 months (SD = 78.03, range: 1-612) and men for 94.19 months (SD = 107.41, range: 1-540). The distribution of relationship statuses among those currently having a relationship was as follows: dating someone (for less than 6 months): 7.9% (women: 9.0%, men: 6.5%), permanent relationship / married: 72.2% (women: 71.1%, men: 74.9%).

Most researchers studying human sexual behavior use Kinsey's scale to assess sexual orientation (e.g. Kinsey, Pomeroy & Martin, 1948; Kinsey, Pomeroy, Martin & Gebhard, 1953). In our view, however, this scale only provides limited information on its subject, since it focuses on only one aspect of a complex phenomenon, namely, on respondents' identity related to their sexual orientation. Since we were also interested in respondents' behavioral experience and sexual desire, they received three questions related to their sexual orientation, which they answered using a 7-point scale in each case as follows.

(A) Please indicate the extent to which you are interested in a sexual partner of the same and/or the opposite gender.

1. I am exclusively interested in a sexual partner of the opposite gender.

2. I am predominantly interested in a sexual partner of the opposite gender, but sometimes I am also interested in one of the same gender.

3. I prefer a sexual partner of the opposite gender, but I am often interested in one of the same gender.

4. I am equally interested in a sexual partner of the same and the opposite gender.

5. I prefer a sexual partner of the same gender, but I am often interested in one of the opposite gender.

6. I am predominantly interested in a sexual partner of the same gender, but sometimes I am also interested in one of the opposite gender.

7. I am exclusively interested in a sexual partner of the same gender.

(B) Please indicate how frequently you have had sexual experience with a partner of the same and/or the opposite gender.

1. I have exclusively had sexual experience with a partner of the opposite gender.

2. I have predominantly had sexual experience with a partner of the opposite gender, but I have also had some experience with a partner of the same gender.

3. I have had more sexual experience with a partner of the opposite gender, but I have also had frequent experience with a partner of the same gender.

4. I have equally had sexual experience with a partner of the same and the opposite gender.

5. I have had more sexual experience with a partner of the same gender, but I have also had frequent experience with a partner of the opposite gender.

6. I have predominantly had sexual experience with a partner of the same gender, but I have also had some experience with a partner of the opposite gender.

7. I have exclusively had sexual experience with a partner of the same gender.

(C) Please indicate which of the below definitions best describes your sexual orientation.

0. Exclusively heterosexual

1. Predominantly heterosexual, only incidentally homosexual

2. Predominantly heterosexual, but more than incidentally homosexual

3. Equally heterosexual and homosexual

4. Predominantly homosexual, but more than incidentally heterosexual

5. Predominantly homosexual, only incidentally heterosexual

6. Exclusively homosexual

The following findings were obtained with these three questions. Of the overall sample, 78.0% were exclusively interested in a sexual partner of the opposite gender (women: 68.7%,

men: 90.1%); 18.8% were predominantly interested in a sexual partner of the opposite gender but sometimes also interested in one of the same gender (women: 27.5%, men: 7.4%); 1.7% preferred a sexual partner of the opposite gender, but they were often interested in one of the same gender (women: 2.2%, men: 0.9%); all other response alternatives were selected by 1.6% in total (women: 1.5%, men: 1.6%). Of the overall sample, 82.2% had exclusively had sexual experience with a partner of the opposite gender (women: 75.6%, men: 90.8%); 15.0% had predominantly had sexual experience with a partner of the opposite gender, but they had also had some experience with a partner of the same gender (women: 21.3%, men: 7.0%); 1.2% had had more sexual experience with a partner of the opposite gender, but they had also had frequent experience with a partner of the same gender (women: 1.4%, men: 0.9%); all other response alternatives were selected by 1.6% in total (women: 1.7%, men: 1.2%). Of the overall sample, 81.3% reported to be exclusively heterosexual (women: 74.7%, men: 89.9%); 15.9% to be predominantly heterosexual, only incidentally homosexual (women: 21.8%, men: 8.3%); 1.3% to be predominantly heterosexual but more than incidentally homosexual (women: 1.7%, men: 0.7%); all other response alternatives were selected by 1.5% in total (women: 1.7%, men: 1.1%). The relationship between sexual orientation and sexual motivation falls outside the scope of the present paper. A separate paper will be dedicated to this subject.

Supplement 5 *Hungarian Version and Short Form of Reasons for Having Sex Questionnaire (YSEX?-HSF)*

People have sex (i.e., sexual intercourse) for many different reasons. Below is a list of some of these reasons. Please indicate how frequently each of the following reasons led you to have sex in the past. For example, if about half of the time you engaged in sexual intercourse you did so because you were bored, then you would circle “3” beside question 4. If you have not had sex in the past, use the following scale to indicate what the likelihood that each of the following reasons would lead you to have sex.

I have had sex in the past because...

1	2	3	4	5
None of my sexual experiences	A few of my sexual experiences	Some of my sexual experiences	Many of my sexual experiences	All of my sexual experiences

Item #	Item Description	Rating				
1.	I wanted a new experience.	1	2	3	4	5

2. I love variety.	1	2	3	4	5
3. It was forbidden.	1	2	3	4	5
4. It was trendy.	1	2	3	4	5
5. I didn't want to be the odd one out.	1	2	3	4	5
6. I wanted to be cool.	1	2	3	4	5
7. My partner did not want to have sex with me (so I had sex with someone else).	1	2	3	4	5
8. My partner was not able to have sex with me (so I had sex with someone else).	1	2	3	4	5
9. My partner is not adventurous enough (so I had sex with someone else).	1	2	3	4	5
10. I was under the influence of alcohol.	1	2	3	4	5
11. I was in an altered state of consciousness.	1	2	3	4	5
12. We hooked up in the heat of the moment.	1	2	3	4	5
13. I wanted I wanted to infuriate someone.	1	2	3	4	5
14. I wanted to take revenge.	1	2	3	4	5
15. I wanted to make my partner jealous.	1	2	3	4	5
16. I wanted to seek experience.	1	2	3	4	5
17. It was a seduction/I was seduced.	1	2	3	4	5
18. I took the opportunity.	1	2	3	4	5
19. I wanted to control the other person.	1	2	3	4	5
20. I wanted to demonstrate my power.	1	2	3	4	5
21. Out of a desire for possession.	1	2	3	4	5
22. To prove myself.	1	2	3	4	5
23. I wanted to boost my self-esteem.	1	2	3	4	5
24. I wanted to feel appreciated.	1	2	3	4	5
25. I wanted to have an orgasm.	1	2	3	4	5
26. Because of sexual desire.	1	2	3	4	5
27. I wanted pleasure.	1	2	3	4	5
28. It seemed like the next step in the relationship.	1	2	3	4	5
29. I wanted to deepen the relationship.	1	2	3	4	5
30. I wanted the relationship to grow.	1	2	3	4	5
31. The person had an attractive body.	1	2	3	4	5
32. The person smelled good.	1	2	3	4	5
33. The person had an attractive personality.	1	2	3	4	5
34. I wanted to feel fresh.	1	2	3	4	5
35. I wanted to reduce stress.	1	2	3	4	5
36. I wanted to recharge myself.	1	2	3	4	5
37. I was in love.	1	2	3	4	5
38. We were made for each other.	1	2	3	4	5
39. Out of passion.	1	2	3	4	5
40. I wanted to have sex in an unusual place or situation.	1	2	3	4	5
41. It was a special occasion/situation.	1	2	3	4	5
42. I wanted to try out new sexual techniques or positions.	1	2	3	4	5
43. I wanted to spiritually merge with the other person.	1	2	3	4	5
44. I wanted to express myself.	1	2	3	4	5
45. To get on the same wavelength with the other person.	1	2	3	4	5
46. I wanted to care for the other person.	1	2	3	4	5
47. I wanted to cheer up the other person.	1	2	3	4	5

48. I wanted to celebrate.	1	2	3	4	5
49. I wanted to make my partner happy.	1	2	3	4	5
50. I wanted to be/feel happy.	1	2	3	4	5
51. The touch of the person was pleasant.	1	2	3	4	5
52. I wanted to decrease loneliness.	1	2	3	4	5
53. Because I lacked love.	1	2	3	4	5
54. I wanted to decrease sadness.	1	2	3	4	5
55. Out of duty.	1	2	3	4	5
56. Out of habit/routine.	1	2	3	4	5
57. I wanted to avert my partner's suspicion.	1	2	3	4	5
58. I wanted to profit from it.	1	2	3	4	5
59. It was a way to reach my goal.	1	2	3	4	5
60. I wanted to benefit from it.	1	2	3	4	5
61. I wanted to apologize.	1	2	3	4	5
62. I wanted to make peace with the other person.	1	2	3	4	5
63. I wanted to appease the other person.	1	2	3	4	5
64. I wanted to submit myself.	1	2	3	4	5
65. I wanted to seek safety.	1	2	3	4	5
66. I wanted to prove sg to my partner.	1	2	3	4	5
67. I wanted to give in.	1	2	3	4	5
68. It was a favor.	1	2	3	4	5
69. Out of compassion.	1	2	3	4	5
70. I wanted to comfort the other person.	1	2	3	4	5
71. I wanted to retain the relationship.	1	2	3	4	5
72. I wanted to save the relationship.	1	2	3	4	5
73. Not to lose the other person.	1	2	3	4	5

Scoring System

Scale	Subscale	Item Numbers	Score Range
Personal goal attainment		1-24	8-40
	Novelty seeking	1-3	3-15
	Conformity	4-6	3-15
	Infidelity	7-9	3-15
	Impulsiveness	10-12	3-15
	Revenge	13-15	3-15
	Sensation seeking	16-18	3-15
	Control and power	19-21	3-15
	Self-esteem boost	22-24	3-15
Relational reasons		25-51	9-45
	Sexual desire	25-27	3-15
	Commitment	28-30	3-15
	Physical attraction	31-33	3-15
	Relaxation	34-36	3-15
	Intimacy	37-39	3-15
	Excitement	40-42	3-15

	Self-affirmation	43-45	3-15
	Care	46-48	3-15
	Happiness seeking	49-51	3-15
Sex as coping		52-73	7-35
	Mitigating emotional deficit	52-54	3-15
	Compulsion and avoidance	55-57	3-15
	Utilitarianism	58-60	3-15
	Coping with relational conflicts	61-63	3-15
	Submissiveness	64-67	4-20
	Coping with partner's emotional demands	68-70	3-15
	Mate retention	71-73	3-15

Note: Subscale scores are computed by adding the scores of the individual items that comprise the subscale. Scale scores are computed by adding the scores of the items that comprise each of the subscale under that specific factor.

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2.3 Why Hungarians Have Sex: Development and Validation of a Brief 15-Item Instrument (YSEX?-15H)[3]

Norbert Meskó[1*], András N. Zsidó[1], Béla Birkás[2], Cindy M. Meston[3], David M. Buss[3]

[1]Institute of Psychology, University of Pécs, Ifjúság utca 6., Pécs 7624, EU, Hungary

[2]Department of Behavioural Sciences, University of Pécs, Pécs, EU, Hungary

[3]Department of Psychology, University of Texas at Austin, Austin, TX, USA

*Corresponding author

Abstract

The present study developed a brief version of the Hungarian Why Sex? questionnaire (Meskó et al., 2022). The study was in part based on previously reported data obtained from several samples (N = 6193; 1976 men, 4217 women). Using Mokken Scaling Procedure, Item Response Model and redundancy analysis indicated that retaining three summary scales comprising five items each was the optimal solution for the brief version. The validity of the brief scale was tested with the Sexual System Functioning Scale (SSFS), the Experiences in Close Relationships Scale–Short Form (ECR-S) and, the Hungarian version of the Attachment Style Questionnaire (ASQ-H; n = 297, 127 men, 170 women). In addition, correlations between the long and brief versions of YSEX? with sociosexual orientation (SOI-R) and the five-factor personality construct (BFI-S) were compared (n = 1024, 578 women, 446 men). The results suggest that the three summary scales of the Hungarian 15-item Form of the Why Sex Questionnaire (YSEX?-15H) provide reliable and valid measures of the previously affirmed three broad sexual motives (Personal Goal Attainment, Relational Reasons, Sex as Coping). The Relational Reasons summary scale was associated with secure emotional and sexual attachment. The Personal Goal Attainment and Sex as Coping summary scales showed coherent patterns of associations with the emotional and sexual aspects of secondary attachment strategies (over- and under-functioning). The YSEX?-15H offers both researchers and practitioners a concise and useful instrument for the assessment of sexual motivation.

Keywords: sexual motivation, gender differences, YSEX?, sexual intercourse.

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Introduction

Sexual motivation is partly captured by the reported reasons people give to engage in sexual activity. These, in turn, have an impact on the dynamics of intimate partner relationships and partners' mental health (e.g., Davis et al., 2004; Hatfield et al., 2010; Impett et al., 2005; Meston & Buss, 2007). Extensive research suggests that one's personal style of caring for others and sexual motives are affected by individual differences in attachment history (see Feeney & Noller, 2004 for a review). Sexual intercourse can satisfy an individual's need for closeness, intimacy and attachment for relationship stability and reassurance (Péloquin et al., 2013). Sexual activity is influenced by a number of biopsychosocial factors, as well as contextual factors of the relationship, such as the type and duration of the relationship and the attachment style of the partners (Meston & Stanton, 2017). Attachment strategies develop early in life, which predict desired levels of intimacy and interdependence in a romantic relationship and also the sexual system in regulating sexual interactions between romantic partners (see Mikulincer & Shaver, 2012 for an overview). The person's attachment and sexual behavioral system are thought to interact after puberty, as sex may serve attachment-related needs (e.g., intimacy, emotional closeness; Davis et al., 2004; Dewitte, 2012). Hyperactivation of the sexual system triggers intense sexual impulses and sometimes elevated anxiety in intimate settings; sexual deactivation leads to an inhibition of sexual inclinations (Birnbaum et al., 2014). For example, when experiencing closeness or intimacy, individuals with an avoidant attachment style show elevated discomfort, which may compromise their sexual and intimate experiences leading to increased dissatisfaction of one's sex life. Another form of insecure attachment—anxious attachment—is associated with enhanced worries and fears of disapproval or rejection in the relationship. These fears can increase anxiety in the relationship and reduce sexual satisfaction and overall quality of the relationship (Dewitte, 2012). Individuals with insecure attachment styles express high needs for security in the relationship, attention and approval of the partner and express more self-doubts regarding sexuality, the main source of their conflicts in sexual encounters (Davis et al., 2004; Shaver & Mikulincer, 2006). Differences in attachment styles also result in differences in sexual motives. Individuals with more pronounced attachment anxiety show increased sexual motivation in order to reduce insecurity and establish intense closeness, whereas individuals with elevated attachment avoidance are more motivated to have sex to impress their peers or other social reference group, especially if they have the opportunity to engage in casual, uncommitted sex (Schachner & Shaver, 2004).

Sexual behaviors and motives also vary by the age of the person. For example, older couples are more emotionally and interpersonally oriented in sex compared to younger couples (Gewirtz-Meydan & Ayalon, 2019). Moreover, older individuals tend to get aroused rather more by eroticism in sex compared to younger people (Purnine & Carey, 1998), value sexual motives such as dominance, experimentation or defiance against social norm less (Browning, 2004; Wyverkens et al., 2018) and are generally less motivated to engage in sexual behaviors than younger individuals (Gray et al., 2019). Older individuals generally have lower sexual motivation than younger ones.

Several previous studies pointed out gender differences in sexual motivation (e.g., Meskó et al., 2022; Meston & Buss, 2007; Meston et al., 2009, 2020), showing that women more than men are motivated by relationship-focused reasons (e.g., I was in love; I wanted to make my partner happy; Out of mutual appeal). Men more than women are more likely to report self-focused reasons (e.g., To seek pleasure; I love sex; I wanted to be/feel happy). Compared to men, women respectively assigned more importance to emotional than physical motives for sexual activity (Denney et al., 1984; Leigh, 1989; Meston & Buss, 2007; Wyverkens et al., 2018). Klusmann (2002) reported that while both women's and men's intimate partners' sexual activity and satisfaction decreased with time duration of the relationship, sexual desire decreases in women, whereas the motivation for sexual intimacy fades largely in men. Buss (2006) suggests that women show higher preference for sexual intimacy and a committed sexual relationship than men because these signs of love provide cues to the man as a partner's long-term commitment. Men on average are more motivated by sex without necessarily having an emotional connection with the partner (Meston & Buss, 2007). Men also report more frequent sexual activity and higher sexual motivation than women (Gray et al., 2019). Cruz and Humeau (2019) found that the participants' most important sexual motives were consistent with those found in most studied cultures, such as strengthening the relationship and increasing the partner's well-being and satisfaction.

In a series of studies conducted among university students, Meston and Buss (2007) identified a wide array of 237 reasons for having sex. Of these, 142 reasons composed four summary scales including Physical Reasons, Goal Attainment Reasons, Emotional Reasons and Insecurity Reasons, which were consistent across genders. A principal component analysis of the items of each summary scale specified a total of 13 subscales. The Meston and Buss instrument has now been translated into several languages. This has opened the way for cross-cultural comparisons (see Gouvernet et al., 2017; Ozcan et al., 2017), but is limited in that translated adaptations of existing measures do not take into consideration the importance of cultural factors on the

diversity of sexual motives. Chadwick et al. (2017) argue that different language use and ways of thinking in different cultures and subcultures can result in different ways of articulating otherwise general psychological phenomena such as sexual motivation. Using the same methodology as Meston and Buss (2007), Meskó et al. (2022) recently developed a short form Hungarian version of the YSEX? questionnaire (YSEX?-HSF). The most commonly endorsed reasons for having sex were similar among the American and Hungarian samples. While the original YSEX? comprises four summary scales and 13 subscales, the YSEX?-HSF has three summary scales and 24 subscales. These findings reflect both the cross-cultural universality and diversity of sexual motivation.

This short form version of the scale (YSEX-HSF) consists of 73 items which, while considerably shorter than the original 237-item YSEX? questionnaire, still limits its usability among researchers conducting wide-scale research. Compared to their longer versions, brief questionnaires might be more preferable for various reasons: scales including more items may provide more information and more comprehensive data but are prone to increased respondent fatigue, higher response error rates and lower rates of completion (Rolstad et al., 2011; Saucier, 1994). Moreover, psychometric quality is thought to be less affected by the shortening of scales, because of redundancy reduction; consequently, more concise self-report instruments may show even greater validity indexes (Burisch, 1997). Therefore, developing short and multidimensional questionnaires with high psychometrical quality is beneficial for both researchers and participants (Jonason & Webster, 2010). Accordingly, since previous studies employing the YSEX?-HSF confined their focus to the three summary scales reflecting on the three overarching sexual motives found among Hungarians (e.g., Birkás et al., 2020; Láng et al., 2021; Meskó et al., 2021), we aimed to develop a brief scale for assessing these three broad motives. Including a reliable and validated reduced-item version of YSEX? in surveys or field studies provides limited, but relevant data on participant's sexual motives. The brief version can also be fruitfully utilized in qualitative research or in applied settings, where a compact assessment of sexual motives is sufficient. Developing a reliable and valid brief measure also requires establishing the nomological network (Cronbach & Meehl, 1955) by identifying links to other key psychological variables such as age, gender, attachment style and sociosexual orientation.

In line with the above mentioned findings and former studies indicating significant sex and age differences on certain measures of the 73-item YSEX?-HSF (Meskó et al., 2022), possible sex and age differences on the three summary scales of the YSEX?-15H were explored. Specifically, we expected to replicate previous findings (e.g., with the 73-item YSEX?-HSF), where men scored higher than women on Personal Goal Attainment, while women scored

higher than men on Sex as Coping (no gender difference was found for Relational Reasons). Furthermore, younger participants were more likely than older ones to be sexually motivated by Relational Reasons, whereas older participants scored higher than younger ones on Personal Goal Attainment.

One explanation for individual differences in the reasons for having sex relates to the five-factor personality model (e.g., Heaven et al., 2000; Strus & Cieciuch, 2017). Previous studies linked Big Five personality traits to various components of sexuality including sexual orientation, attitudes toward sex, sexual satisfaction, sexual activity and behavior (see Allen & Walter, 2018 for an overview). Researchers also found significant associations between sexual motivation and the five-factor personality model (GSOEP Big Five Inventory, BFI-S; Hahn et al., 2012) for external validation of YSEX?-HSF (Meskó et al., 2022). Overall, the summary scales and subscales measuring sexual motivation linked positively with Extraversion, Neuroticism and Openness, whereas they correlated negatively with Agreeableness and Conscientiousness. Extraversion had the highest total number of significant associations with sexual reasons and was positively connected with all three summary scales of the YSEX?-HSF (Personal Goal Attainment, Relational Reasons and Sex as Coping). Only one scale in the sample of women revealed a significant (positive) connection with neuroticism: those reporting higher degrees of emotional instability scored higher on the Sex as Coping. Only one scale had a significant (negative) correlation with Agreeableness: those with higher levels of Agreeableness scored higher on the Personal Goal Attainment. In the men's subsample, Conscientiousness was also related (negatively) with only one scale: those who considered themselves to be more Conscientious scored lower on the Personal Goal Attainment scale. All three YSEX?-HSF summary scores were positively associated with Openness.

Another important factor for explaining gender differences in sexual motivation is sociosexual orientation (e.g., Lippa, 2009; Schmitt, 2005). Sociosexual orientation refers to the level of restrictions individuals set on sexual relationships thus, the importance of commitment, intimacy and feelings to participate in sexual activities (Simpson & Gangestad, 1991). Similarly to personality traits, sexual strategies (Revised Sociosexual Orientation Inventory (SOI-R; Penke & Asendorpf, 2008) were also found to be relevant for external validation of YSEX?-HSF (Meskó et al., 2022). For each gender group, the connections between the global sociosexual orientation index and various sexual reasons were investigated. The same general pattern was obtained for both men and women (positive correlations were found in all cases), but while almost all summary scales and subscales of the YSEX?-HSF showed a marked association with sociosexuality in the sample of men, the same held true for only one subfactor of the Sex as

Coping factor in the sample of women. In both gender groups, sociosexuality had the sole negative correlation with the Intimacy subscale.

Research Aim

The aims of the present study were threefold: First, to reduce the number of items of the YSEX?-HSF in order to develop a shorter, more ecological instrument, without compromising its ability to assess the three major dimensions of sexual motives captured by the extended version. Analyzing the external validity of the YSEX?-15H was also aimed to ensure the psychometric quality of the brief scale creating a more concise measure of sexual motivation for early-stage research and pilot studies requiring data on the fundamental patterns of sexual motives. The second aim of the study was to test the replicability of the sex and age differences found by former studies in a relatively large sample. Our third goal was to examine the broader nomological network and in this way externally validate the new brief questionnaire, utilizing two different methods (Cronbach & Meehl, 1955). First, we tested whether the newly developed brief instrument is associated in the expected direction to the questionnaires on relationship attachment, a key factor in sexuality. Second, we expected that the associations with big five personality traits (BFI-S) and sociosexual orientation (SOI-R) used to validate the 73-item YSEX?-HSF (Meskó et al., 2022) would show similar correlations with the short YSEX?-15H scale.

Method

Participants and Procedure

Data were collected from 8 different samples in which 73 items of the YSEX?-HSF were applied together with different questionnaires (see Table 1 for demographic data and list of questionnaires used). The dataset was divided into two samples: a larger one for the psychometric assessment of the YSEX?-15H and a smaller one for external validation. Thus, these two samples comprised a total of eight subsamples, all of which were involved in previous studies (Birkás et al., 2020; Láng et al., 2021; Meskó et al., 2021), although some of the datasets have not been reported in detail before. The samples utilized for validations (external validation #1 with SSFS, ECR-S, ASQ-H = Sample 1; external validation #2 with SOI-R, BFI-S = Sample 7) were subsamples of the overall dataset (Total Study Sample). For further details, see Table 1. Sampling method might affect psychometric properties of scales or self-report measures thus, data analysis should reflect on this and filter possible biases. Statistical methods utilized in this study were selected accordingly (Kleka & Soroko, 2018). All data were collected online. The survey was edited in Google Forms. The link to the survey was disseminated via Facebook and

via one of the most popular and influential Hungarian internet portals, Index (https://index.hu/). All participants gave informed consent, and none of them was rewarded for participation. To control the quality and reliability of survey data, duration of completion was registered and patterns of answers for a scale were analyzed in order to exclude unrealistic (i.e., too short or too long) answering times or patterns (i.e., giving the same option for all the items within a scale). The study received ethical approval as part of a larger research project on mating strategies from the Hungarian United Ethical Review Committee for Research in Psychology (Ref. No. 2017/21). All source data are available at: https://osf.io/qbjkm/?view_only=fd6b38d0f0b0400e83b0a71e5661e64f.

Table 1 *Demographics of the samples*

	Total Study sample	Sample 1	Sample 2	Sample 3
N	6193	307	465	572
woman/man, n (%)	1976/4212 (31.9/68.1%)	134/173 (43.6/56.4%)	319/146 (68.6/31.4%)	425/147 (74/26%)
age (women) M (SD)	27.42 (9.22)	34.63 (10.71)	28.9 (9.5)	24.51 (7.74)
age (men) M (SD)	36.47 (13.17)	26.50 (8.87)	33.6 (12.9)	29.14 (10.04)
highest level of education				
• tertial		160 (52.1%)	63%	227 (39.9%)
• secondary		143 (46.6%)	35.3%	328 (57.3%)
• primary		4 (1.3%)	1,7%	17 (3%)
relationship status				
• single		10 (3.3%)	6%	109 (19.1%)
• casual relationships		43 (14%)	161 (35%)	35 (6.1%)
• committed relationship		103 (33.5%)	152 (33%)	373 (65.2)
• married		80 (26.1%)	120 (26%)	47 8.2%)
• other forms of relationships		71 (23.1%)	-	8 (1.4%)
measures		YSEX?-HSF, SSFS, ASQ-H, ECR-S	YSEX?-HSF, RAS-H, DCI-H, STLS-H	YSEX?-HSF, DERS, FOS
publication	this study	this study	Meskó et al., (in press)	under preparation

	Sample 4	Sample 5	Sample 6	Sample 7	Sample 8
N	800	880	984	1024	1161
woman/man, n (%)	439/361 (55/45%)	695/185 (79/21%)	768/216 (78/22%)	578/446 (56/44%)	820/341 (71/29%)
age (women) M (SD)	32.47 (10.93)	24.43 (8.04)	22.62 84.54)	30.47 (8.75)	
age (men) M (SD)	46.03 (10.13)	24.01 (5.74)	25.18 (6.48)	38.14 (11.66)	
highest level of education					
tertial		348 (39.5%)	379 (38.5%)		
secondary		494 (56.1%)	552 (56.1%)		
primary		38 (4.3%)	53 85.4.%)		
relationship status					
single	120 (15%)	139 (15.8%)	218 (22.2%)	28 (2,7 %)	221 (19%)
casual relationships	60 (7.5%)	75 (8.5%)	76 (7.7%)	133 (13 %)	112 (9.6%)
committed relationship	176 (22%)	602 (68.5%)	616 (62.6%)	281 (27,4%)	-
married	444 (55.5%)	57 (6.5%)	56 (5.7%)	309 (30,2%)	772 (66.5%)
other forms of relationships	-	7 (0.8%)	18 (1.8%)	273 (26,7%)	56 (4.8%)
measures	YSEX?-HSF, LAS-HSF, SOI-R, MVS	YSEX?-HSF, PRIS-SV, FOS	YSEX?-HSF, SD3, WSWMS, FOS	YSEX?-HSF, BFI-S, SOI-R	YSEX?-HSF
publication	Meskó et al. (2021b)	under preparation	under preparation	Meskó et al. (2021a) study 3	Meskó et al. (2021a) study 2
sex differences in YSEX?-HSF scales	personal goal attainment: F < M, relational reasons: F = M, sex as coping: F > M			personal goal attainment: F < M, relational reasons: F = M, sex as coping: F > M	

Note: YSEX?-HSF = Hungarian Short Form of the Reasons for Having Sex Questionnaire; SSFS = Sexual System Functioning Scale; ASQ-H = Hungarian Version of the Attachment Style Questionnaire; ECR-S = Experiences in Close Relationships Scale–Short Form; RAS-H = Hungarian version of the Relationship Assessment Scale; DCI-H = Hungarian version of the Dyadic Coping Inventory; STLS-H = Hungarian version of the Sternberg Triangular Love Scale; DERS = Difficulties in Emotion Regulation Scale; FOS = Faking Orgasm Scale in Women; SOI-R = Revised Sociosexual Orientation Inventory; LAS-HSF = Hungarian Short Form of Love Attitudes Scale; MVS = Mate Value Scale; PRIS-SV = Short Version of the Partner and Relationship Ideal Scales; SD3 = Short Dark Triad; WSWMS = Women's Sexual Working Models Scale; BFI-S = GSOEP Big Five Inventory.

Measures

For the external validation #1 of the YSEX?-15H questionnaire, scales measuring attachment patterns and sexual system functioning (based on attachment theory) were chosen. The inclusion of attachment instruments enables the linking of proximal causes of human sexual behavior (sexual motivations) with deep structures of behavior (different patterns of attachment need). Given that the relationship between attachment and sexual motivations is well documented (e.g., Birnbaum et al., 2014; Davis et al., 2004; Feeney & Noller, 2004; Shaver & Mikulincer, 2006), we intended to link our newly developed instrument to this body of empirical evidence and associated theory. Based on the former validation process of YSEX?-HSF (73-item version), we conducted another, separate external validation (#2) where we used the same measures (SOI-R, BFI-S) as in the original study (Meskó et al., 2022) in order to make the newly developed brief version even more comparable with the original long form. For results regarding validation #2 see Table 3.

The authors first translated the items of, and instructions for, the Sexual System Functioning Scale (SSFS) and Experiences in Close Relationships Scale–Short Form (ECR-S) into Hungarian, and the obtained Hungarian version was verified with the standard back-translation technique (Brislin, 1980). Specifically, the items and instructions were retranslated into English by an independent translator unaffiliated with the study, and the two translators then resolved minor discrepancies that emerged during the back-translation procedure.

Reasons for Having Sex Questionnaire, Hungarian Short Form (YSEX?-HSF)

The development procedure of the YSEX?-HSF involving Hungarian participants (Meskó et al., 2022) followed that of the original American version (YSEX?; Meston & Buss, 2007), item generation, factor analysis, external validation. However, in contrast with the original YSEX? that consists of four summary scales (Meston & Buss, 2007), the 73-item YSEX?-HSF has three summary scales assessing three major types of sexual motives including Personal Goal Attainment (e.g., I wanted a new experience; It was a seduction/I was seduced), Relational Reasons (e.g., I was in love; I wanted to spiritually merge with the other person) and Sex as Coping (e.g., I wanted to decrease sadness; I wanted to save the relationship). Each item is rated on a 5-point scale offering the following options: 1 = None of my sexual experiences; 2 = Few (…); 3 = Some (…); 4 = Many (…); 5 = All of my sexual experiences. Thus, higher scores reflect higher levels on each measure of sexual motives.

Sexual System Functioning Scale (SSFS)

The SSFS (Birnbaum et al., 2014) includes 24 items measuring individual variations in sexual system functioning. The two subscales (12 items each) measure sexual hyperactivation

and sexual deactivation. The Hyperactivation subscale measures desire for and anxiety about sexual intercourse (e.g., I worry about not being "good enough" in bed). The Deactivation subscale taps a lack of interest in and discomfort with sexual contact (e.g., I find it hard to feel comfortable during sexual intercourse). Higher scores on each SSFS subscale reflect higher levels of sexual hyperactivation and sexual deactivation. Both subscales showed adequate internal consistency (McDonald's omega = 0.83 and 0.81 for Sexual Hyperactivation and Sexual Deactivation, respectively).

Experiences in Close Relationships Scale–Short Form (ECR-S)

The ECR-S (Wei et al., 2007) is a 12-item measure of adult attachment. The scale comprises two subscales assessing two continuous attachment dimensions. Attachment Avoidance measures avoidance of intimacy with romantic partners (e.g., I do not often worry about being abandoned); Attachment Anxiety measures anxiety evoked by the actual or imagined separation from romantic partners (e.g., I need a lot of reassurance that I am loved by my close loved ones). Higher scores reflect higher levels of Attachment Anxiety and Attachment Avoidance. Both subscales showed adequate internal consistency (McDonald's omega = 0.81 and 0.76 for Attachment Anxiety and Attachment Avoidance, respectively).

Hungarian Version of the Attachment Style Questionnaire (ASQ-H)

The ASQ (Feeney et al., 1994; adapted to Hungarian by Hámori et al., 2016) is a 40-item scale assessing individual patterns of distinct attachment dimensions. The scale comprises five subscales, each measuring a distinct dimension, including Relationships as Secondary (RS; e.g., Achieving things is more important than building relationships), Need for Approval (NA; e.g., It's important to me that others like me), Discomfort with Closeness (DC; e.g., I prefer to depend on myself than on other people), Preoccupation with Relationships (PR; e.g., I find that others are reluctant to get as close as I would like) and Confidence in Relationships (CR; e.g., I feel confident that other people will be there for me when I need them). Higher scores reflect higher levels of each attachment dimension. All five subscales showed adequate internal consistency (McDonald's omega = 0.76, 0.74, 0.73, 0.73 and 0.75 for Relationships as Secondary, Need for Approval, Discomfort with Closeness, Preoccupation With Relations and Lack of Confidence, respectively).

Revised Sociosexual Orientation Inventory (SOI-R)

The Revised Sociosexual Orientation Inventory (SOI-R; Penke & Asendorpf, 2008; Hungarian version: Meskó et al., 2014) comprises nine items assessing one's willingness to engage in uncommitted sexual encounters. The items compose three subscales measuring the three components of behavior, attitude and desire. Responses are given on 9-point rating scales (scale

anchors vary across items). Higher scores on each subscale indicate more unrestricted sociosexuality in terms of behavior, attitude and/or desire. McDonald's omega values for the three subscales and the overall scale were as follows: Behavior: 0.81; Attitude: 0.85; Desire: 0.88; SOI-R (overall): 0.86.

GSOEP Big Five Inventory (BFI-S)

The GSOEP Big Five Inventory (BFI-S; Hahn et al., 2012) measures five major domains of personality: Neuroticism (N), Extraversion (E), Openness to Experience (O), Agreeableness (A) and Conscientiousness (C). BFI-S consists of 15 items, three for each dimension. The answers are given on a 7-point Likert scale ranging from 1 (does not apply to me at all) to 7 (applies to me perfectly). McDonald's omega values for the three subscales and the overall scale were as follows: Neuroticism: 0.74; Extraversion: 0.72; Openness: 0.57; Agreeableness: 0.45; and Conscientiousness: 0.65, respectively.

Statistical Analyses

First, we conducted a redundancy analysis using the Mokken Scaling Procedure (MSP; Mokken & Lewis, 1982), since visual inspection of the data indicated highly synonymous items. The MSP identifies items that cluster together as a result of high similarity or synonymous content. The analysis returns a scalability coefficient (H) ranging from 0 to 1 for each possible pair of items. The closer the item pair is in similarity, the higher the H value will be. We set two criteria to identify redundant item pairs: (1) An H value greater than 0.50 (Mokken, 1971) and (2) Visual verification of synonymy. In each redundant case, the item judged by the authors as having a better wording was retained, while the other item was removed.

An item response analysis (IRT) was then performed using the unidimensional Graded Response Model (GRM; Samejima, 1968) separately for each summary scale of the YSEX?-HSF. This model specifies a discrimination parameter (a) for each item, which shows how closely the item is related to the latent trait. The higher this a value is, the better discrimination property an item has. The best five items (with the highest a values) were selected from among those with high discrimination ability ($a > 1.35$; Baker, 2001). Utilizing this method might reduce the culture dependency of scales with including only items, which are the most discriminant regarding respondents high or low on the latent trait and provide the most information of the respondent. Item information curves (IICs) were then calculated for all items and test information functions (TIF) for all summary scales.

Next, we calculated McDonald's ω coefficients to check the internal consistency of each summary scale of the YSEX?-HSF. We chose the McDonald's omega over Cronbach's alpha because it allows a more accurate measure of internal consistency when the assumptions of the

tau-equivalent model (i.e., violation of the equal-item variance) is not met (Dunn et al., 2014). The correlation between the YSEX?-15H and the YSEX?-HSF was assessed after correcting for redundancy due to shared items (Levy, 1967).

The Personal Goal Attainment and Sex as Coping summary scales had a negative binomial distribution, therefore we performed a Box–Cox transformation to allow for parametric testing.[Footnote 1] After the transformation, the obtained skewness and kurtosis values (<|1.15|) and a visual inspection of the Q–Q plots indicated close-to-normal distributions. Then, we tested for gender differences on all three summary scales with independent samples t-tests and for correlations with age using Pearson's coefficients. Due to the large sample size, the Bayesian versions of these tests were also conducted to obtain BF10 values.

To test the psychometric properties of the YSEX?-15H, a confirmatory factor analysis (CFA) was performed on an independent dataset with the robust weighted least squares with mean and variance adjusted (WLSMV) estimator. Model fit assessment was based on the comparative fit index (CFI), the Tucker–Lewis index (TLI), the root mean square error of approximation (RMSEA) and the standardized root mean squared residual (SRMR). The cutoff values of good model fit were CFI/TFI ≥ 0.95 (Hu & Bentler, 1998) and RMSEA/SRMR ≤ 0.08 (Browne & Cudeck, 1993).

The external validity of the YSEX?-15H was tested with Pearson's coefficients for the correlations between each summary scale and each subscale of the SSFS, ECR-S and ASQ-H. The obtained skewness and kurtosis values (<|1.15|) and a visual inspection of the Q–Q plots indicated approximately normal distribution, which justified the use of Pearson's coefficients.

Results

Redundancy Analysis

The Mokken analysis indicated 19 synonymous item pairs (involving 23 items). Of each redundant item pair, the item judged to have better face validity and clearer wording was retained. The retained item were 49, 51, 54, 55, 58, 61, 64, 69, 70 and 71. See Supplement 1 for exact H coefficients.

Item Response Analysis

In order to obtain a brief version that would equally represent each summary scale of the YSEX?-HSF, the five items with the highest a values were retained from each scale, including 16, 17, 18, 19, 20 (Personal Goal Attainment), 27, 36, 39, 47, 48 (Relational Reasons), and 61, 64, 66, 70, 71 (Sex as Coping). Supplement 2 shows the parameter values for all items. See

Supplement 3 and 4 for the final version of the YSEX?-15H with a short evaluation guide in English and in Hungarian, respectively.

The obtained Test Information Function curves indicated that each brief scale provided a reliable measure of the respective latent variable on a wide range of values (Personal Goal Attainment on -2 to 4 SDs, Relational Reasons on − 3 to 3 SDs and Sex as Coping on − 1 to 4 SDs; see the TIF curves in Fig. 1).

Intercorrelations Between the YSEX?-15H and the YSEX?-HSF, and Reliability of the Brief Scales

All three summary scales of the YSEX?-15H showed high positive correlations with the respective scales of the YSEX?-HSF (r = 0.81 for Personal Goal Attainment, r = 0.84 for Relational Reasons and r = 0.81 for Sex as Coping). All three brief scales showed adequate internal consistency (McDonald's omega = 0.79, 0.75 and.73, respectively).

Gender Differences

Men scored higher than women on Personal Goal Attainment ($t(6191) = 12.26$, $p < 0.001$, Cohen's $d = 0.33$, 95% CI = 0.28 to 0.39, BF10 = 4.43 × 1030). Women scored higher than men on Relational Reasons ($t(6191) = 6.65$, $p < 0.001$, Cohen's $d = 0.18$, 95% CI = 0.13 to 0.24, BF10 = 1.10 × 108). Although women scored significantly higher than men on Sex as Coping, the effect size was very low, and the BF10 value indicated an equal evidence to H0 and H1 ($t(6191) = 2.68$, $p = 0.007$, Cohen's $d = 0.07$, 95% CI = 0.02 to 0.13, BF10 = 1.11). The gender differences obtained for each summary scale of the YSEX?-15H are presented in Fig. 2.

Age Differences

Participants' age showed a low positive association with Personal Goal Attainment ($r = 0.034$, 95% CI = 0.009 to 0.059, $p = 0.008$, BF10 = 0.543) and low negative associations with Relational Reasons ($r = -0.206$, 95% CI = − 0.182 to − 0.230, $p < 0.001$, BF10 = 3.28 × 1056) and Sex as Coping ($r = -0.090$, 95% CI = − 0.065 to − 0.115, $p < 0.001$, BF10 = 1.33 × 109). The age differences obtained for each summary scale of the YSEX?-15H are presented in Fig. 2.

Validation of the YSEX?-15H

The external validity #1 of the YSEX?-15H was tested with Pearson's coefficients for the correlations between each summary scale and each subscale of the SSFS, ECR-S and ASQ-H. The YSEX?-15H scales showed weak to moderate correlations with the other subscales, except for ACQ CR, providing evidence of external validity (for further details, see Table 2).

Figure 1 *Test Information Function for the three 5-item summary scales of the YSEX?-15H*

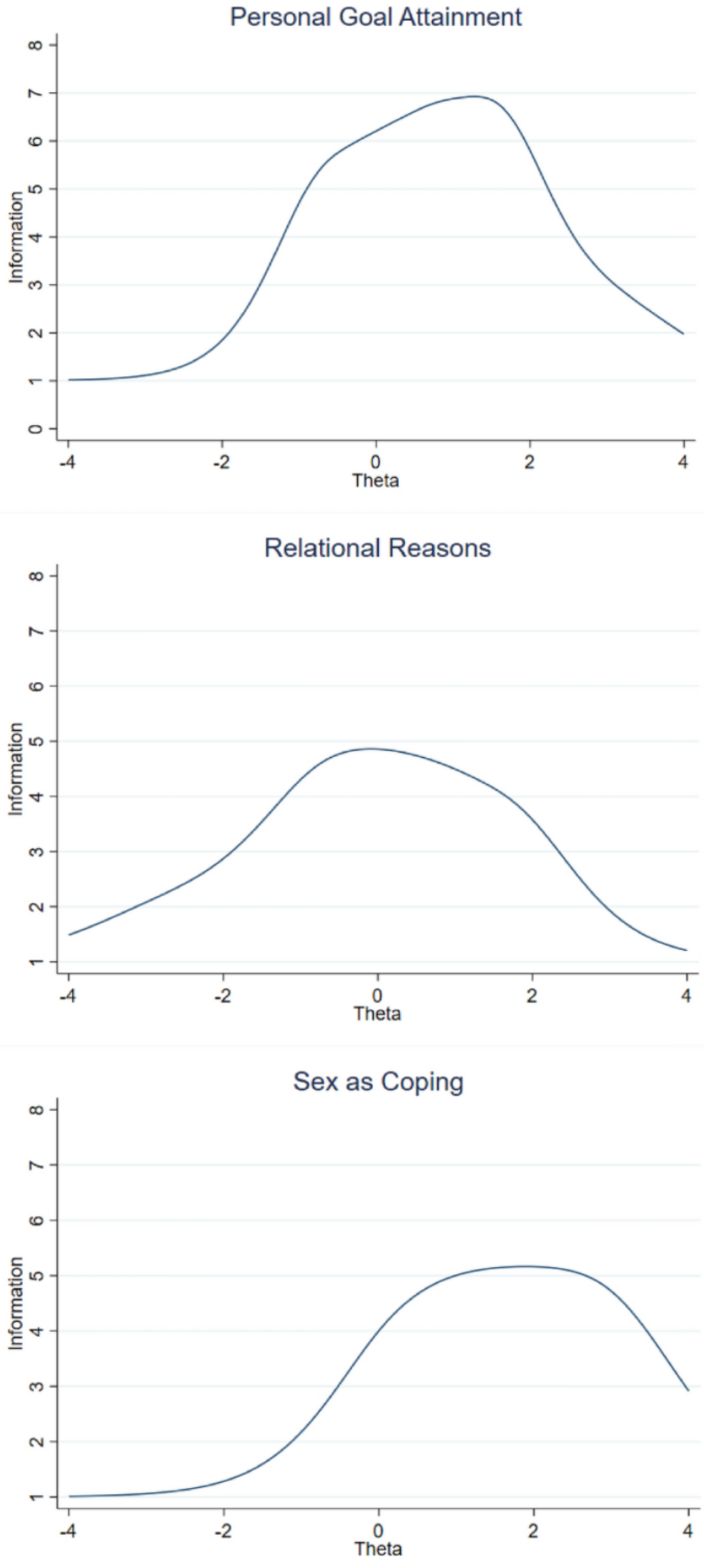


Fig. 2 *Age and gender differences on the three summary scales of the YSEX?-15H*

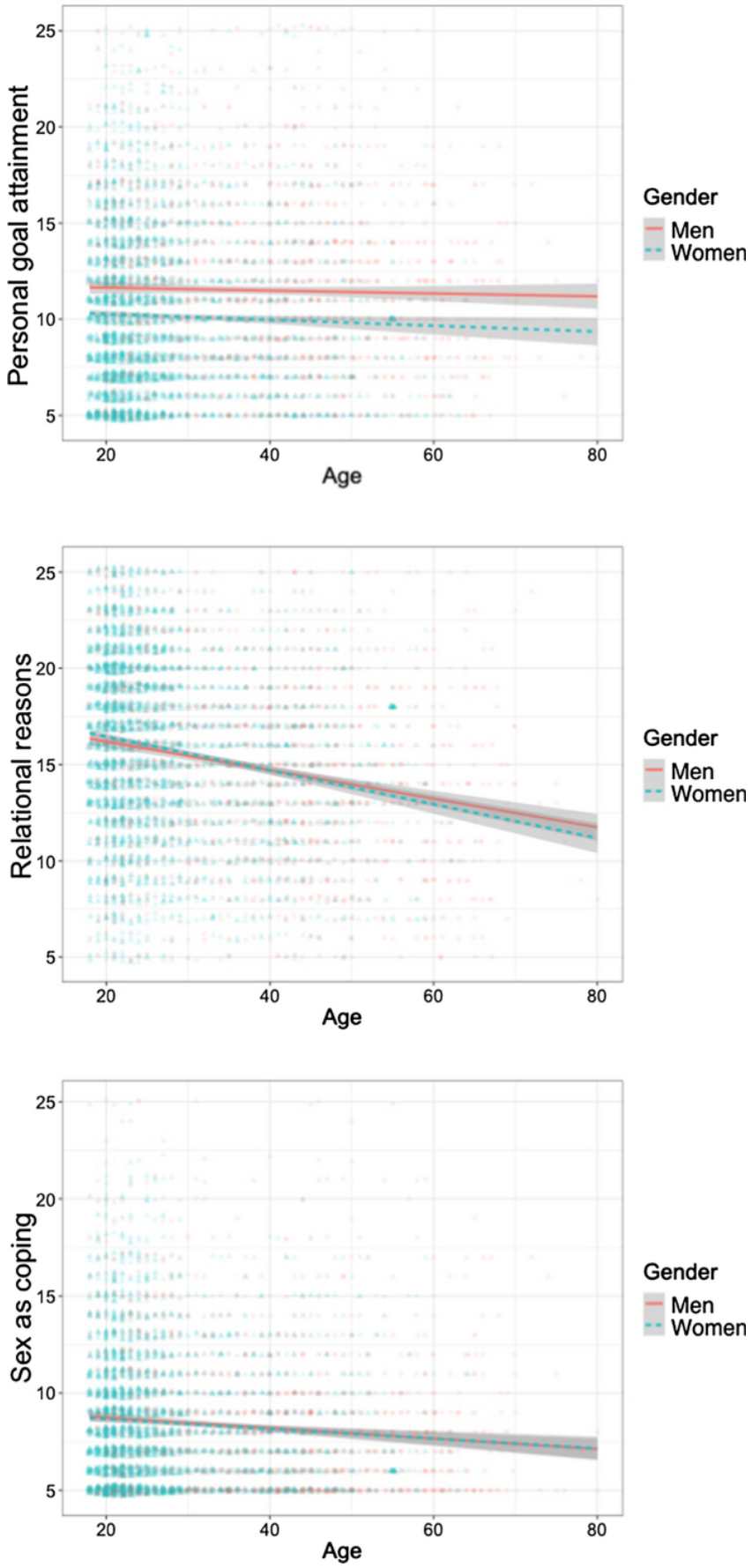


Table 2 *Pearson correlational coefficients with 95% confidence intervals (CI; U – upper, L – lower) between the YSEX?-15H summary scales and each subscale of the SSFS, ECR-S, and ASQ-H questionnaires.*

	Scale		1	2	3	4	5	6	7	8	9	10	11	12
1	Personal Goal Attainment	r	—											
		p-value	—											
		95% CI U	—											
		95% CI L	—											
2	Relational Reasons	r	0.237	—										
		p-value	< .001	—										
		95% CI U	0.342	—										
		95% CI L	0.127	—										
3	Sex as Coping	r	0.448	0.378	—									
		p-value	< .001	< .001	—									
		95% CI U	0.534	0.472	—									
		95% CI L	0.352	0.276	—									
4	SSFS Hyperactivation	r	**0.294**	**0.188**	**0.341**	—								
		p-value	< .001	0.001	< .001	—								

		95% CI U	0.394	0.296	0.438	—				
		95% CI L	0.186	0.076	0.236	—				
5	SSFS Deactivation	r	-0.076	**-0.213**	**0.131**	0.188	—			
		p-value	0.190	< .001	0.024	0.001	—			
		95% CI U	0.038	-0.101	0.241	0.296	—			
		95% CI L	-0.188	-0.319	0.017	0.076	—			
6	ECR-S Avoidance	r	**0.321**	**-0.116**	**0.223**	0.304	0.206	—		
		p-value	< .001	0.046	< .001	< .001	< .001	—		
		95% CI U	0.419	-0.002	0.328	0.404	0.312	—		
		95% CI L	0.215	-0.227	0.112	0.197	0.094	—		
7	ECR-S Anxiety	r	**0.258**	**0.163**	**0.219**	0.546	0.145	0.189	—	
		p-value	< .001	0.005	< .001	< .001	0.012	0.001	—	
		95% CI U	0.361	0.272	0.324	0.621	0.255	0.296	—	
		95% CI L	0.148	0.050	0.108	0.461	0.032	0.077	—	
8	ASQ Relationship as Secondary	r	**0.290**	0.021	**0.237**	0.312	0.181	0.461	0.184	—
		p-value	< .001	0.719	< .001	< .001	0.002	< .001	0.001	—
		95% CI U	0.391	0.134	0.342	0.412	0.288	0.546	0.292	—
		95% CI L	0.182	-0.093	0.127	0.206	0.068	0.367	0.072	—

9	ASQ Need for Approval	r	**0.141**	0.045	**0.228**	0.495	0.343	0.231	0.422	0.296	—		
		p-value	0.015	0.436	< .001	< .001	< .001	< .001	< .001	< .001	—		
		95% CI U	0.251	0.158	0.334	0.577	0.440	0.336	0.511	0.397	—		
		95% CI L	0.028	-0.069	0.118	0.404	0.239	0.120	0.324	0.189	—		
10	ASQ Discomfort with Closeness	r	**0.175**	0.068	**0.285**	0.357	0.193	0.487	0.197	0.428	0.329	—	
		p-value	0.003	0.239	< .001	< .001	< .001	< .001	< .001	< .001	< .001	—	
		95% CI U	0.283	0.181	0.386	0.452	0.301	0.569	0.304	0.517	0.426	—	
		95% CI L	0.062	-0.046	0.177	0.253	0.081	0.395	0.085	0.330	0.223	—	
11	ASQ Preoccupation with Relationships	r	**0.162**	**0.195**	**0.291**	0.510	0.237	0.066	0.638	0.217	0.589	0.185	—
		p-value	0.005	< .001	< .001	< .001	< .001	0.259	< .001	< .001	< .001	0.001	—
		95% CI U	0.271	0.302	0.391	0.589	0.342	0.178	0.701	0.323	0.659	0.293	—
		95% CI L	0.049	0.083	0.183	0.420	0.127	-0.049	0.565	0.105	0.509	0.073	—
12	ACQ Confidence in Relationships	r	-0.065	0.049	-0.103	-0.300	-0.236	-0.356	-0.279	-0.341	-0.443	-0.528	-0.312	—
		p-value	0.266	0.403	0.076	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	—
		95% CI U	0.049	0.162	0.011	-0.193	-0.126	-0.252	-0.171	-0.237	-0.346	-0.440	-0.206	—
		95% CI L	-0.177	-0.065	-0.214	-0.400	-0.341	-0.451	-0.381	-0.438	-0.530	-0.605	-0.411	—

Note: SSFS = Sexual System Functioning Scale; ECR-S = Experiences in Close Relationships Scale – Short Form; ASQ-H = Hungarian Version of the Attachment Style Questionnaire.

Table 3 *Pearson correlational coefficients with 95% confidence intervals (CI; U – upper, L – lower) between SOI-R, BFI-S, the summary scales of YSEX?-15H and YSEX?-HSF*

		YSEX?-HSF Personal Goal Attainment	YSEX?-HSF Relational Reasons	YSEX?-HSF Sex as Coping	YSEX?-15H Personal Goal Attainment	YSEX?-15H Relational Reasons	YSEX?-15H Sex as Coping
YSEX?-HSF Relational Reasons	r	.51 ***	—				
	95% CI Upper	.56	—				
	95% CI Lower	.47	—				
YSEX?-HSF Sex as Coping	r	.56 ***	.54 ***	—			
	95% CI Upper	.60	.58	—			
	95% CI Lower	.52	.49	—			
YSEX?-15H Personal Goal Attainment	r	.88 ***	.51 ***	.45 ***	—		
	95% CI Upper	.89	.55	.50	—		
	95% CI Lower	.87	.46	.40	—		
YSEX?-15H Relational Reasons	r	.48 ***	.87 ***	.49 ***	.47 ***	—	
	95% CI Upper	.53	.89	.54	.52	—	
	95% CI Lower	.44	.86	.45	.42	—	
YSEX?-15H Sex as Coping	r	.47 ***	.51 ***	.87 ***	.40 ***	.47 ***	—
	95% CI Upper	.51	.56	.89	.45	.52	—

	95% CI Lower	.42		.46		.86		.35		.42	—
SOI-R Total	r	.53	***	.04		.08	**	.49	***	.08 **	.03
	95% CI Upper	.57		.10		.14		.53		.15	.09
	95% CI Lower	.48		-.02		.02		.44		.02	-.03
SOI-R Behavior	r	.50	***	.04		.10	**	.43	***	.07 *	.02
	95% CI Upper	.54		.10		.16		.48		.13	.09
	95% CI Lower	.45		-.02		.04		.38		.01	-.04
SOI-R Attitude	r	.39	***	.00		.02		.37	***	.07 *	-.01
	95% CI Upper	.44		.06		.08		.42		.13	.05
	95% CI Lower	.34		-.06		-.04		.31		.01	-.07
SOI-R Desire	r	.39	***	.06	*	.08	**	.37	***	.06 *	.05
	95% CI Upper	.44		.12		.14		.42		.12	.12
	95% CI Lower	.34		.00		.02		.31		.00	-.01
BFI-S Extraversion	r	.16	***	.17	***	.08	*	.17	***	.16 ***	.07 *
	95% CI Upper	.22		.23		.14		.23		.22	.13
	95% CI Lower	.10		.11		.02		.11		.10	.01
BFI-S Neuroticism	r	.01		.03		.17	***	-.02		.04	.10 ***
	95% CI Upper	.07		.09		.23		.04		.10	.16
	95% CI Lower	-.05		-.03		.11		-.09		-.02	.04
BFI-S Agreeableness	r	-.12	***	.02		-.06		-.10	***	.01	-.04

	95% CI Upper	-.06		.09		.00		-.04		.07	.02
	95% CI Lower	-.18		-.04		-.12		-.17		-.05	-.10
BFI-S Conscientious-ness	r	-.04		.05		-.06	*	-.00		.05	-.05
	95% CI Upper	.02		.12		-.00		.06		.11	.01
	95% CI Lower	-.10		-.01		-.12		-.06		-.01	-.11
BFI-S Openness	r	.12	***	.16	***	.06		.13	***	.12 ***	.03
	95% CI Upper	.18		.22		.12		.19		.18	.09
	95% CI Lower	.06		.10		-.00		.07		.06	-.03

Note. * p < .05, ** p < .01, *** p < .001*;* YSEX?-HSF = Reasons for Having Sex Questionnaire, Hungarian Short Form (73-items version); YSEX?-15H = Reasons for Having Sex Questionnaire, Brief Hungarian Form (15 items version); BFI-S = Big Five Inventory Short Version; SOI-R = Revised Sociosexual Orientation Inventory.

The external validity #2 of the YSEX?-15H was tested using Pearson's coefficients for the correlations between BFI-S, SOI-R and the summary scales of YSEX?-HSF and YSEX?-15H. The results show that the correlations of YSEX?-HSF and YSEX?-15H were highly similar with sociosexuality and personality (for further details, see Table 3).

Discussion

Development of the Brief Scale/ Item Reduction

The results indicated that all three summary scales of the YSEX?-15H highly correlated with the respective summary scales of the YSEX?-HSF. A systematic item redundancy analysis ensured that the abridgment procedure would not involve substantial information loss in terms of the three broad sexual motives. Importantly, this brief Hungarian version of YSEX? provides as much information as the YSEX?-HSF in regard to the three broad sexual motives.

The final 15-item YSEX?-15H showed high internal consistency and reliability on a large sample of Hungarian adults. The IRT analysis indicated that most items well discriminated between individuals on a range of the latent trait, while the obtained Test Information Function curves and McDonald's omega values demonstrated the reliability of the information provided by the three summary scales of the YSEX?-15H. All subscales had a positive shift on the latent trait, which reflects the validity of this instrument and shows its usefulness in exploring possible motives in various samples. In sum, the YSEX?-15H is a psychometrically sound brief instrument that provides valid and reliable measures of the three broad sexual motives accounting for most individual differences observed among Hungarian people.

Gender Differences

Another aim of present study was to test the replicability of the sex and age differences of YSEX?-15H in a large sample. Gender differences in sexual motivation assessed by the YSEX?-15H are only partly consistent with those previously obtained with the YSEX?-HSF (Meskó et al., 2022). Both versions indicated that men scored substantially higher than women on Personal Goal Attainment. In contrast, while women scored significantly higher on Relational Reasons as measured by the YSEX?-15H, no comparable sex difference was obtained with the YSEX?-HSF. These results partially replicate previous empirical findings on sexual motivation (e.g., Armstrong & Reissing, 2015; Hill & Preston, 1996; Whalen, 1966). Men more than women tend to prefer self-centered, unemotional reasons for their sexual encounters (e.g., Gray et al., 2019; Meskó et al., 2021, 2022; Meston & Buss, 2007), whereas women tend to prefer emotional, relationship-oriented sexual reasons that presumably enhance the intimate bond (e.g., Denney et al., 1984; Leigh, 1989; Meskó et al., 2021, 2022; Meston & Buss, 2007;

Wyverkens et al., 2018). These gender differences in sexual motivation support the notion that the divergent patterns of desire for sexual intercourse is part of the different mating psychology of men and women (e.g., Conroy-Beam et al., 2019; Crosby et al., 2021; Walter et al., 2021).

In sum, men are more likely to pursue self-focused sexual goals as compared to women, who are more motivated by relationship-related reasons than men are, while men and women are equally motivated to deal with their emotional problems by engaging in sexual activity. Some studies (e.g., Cooper et al., 1998; Patrick et al., 2011) found that men reported higher coping motivation than women, while in other studies, conversely, women reported higher coping motivation than men (e.g., Meskó et al., 2021, 2022). Still other studies found no gender differences in coping motivation (e.g., Barber & Cooper, 2014; Jardin et al., 2017). These contradictory results on coping motives may suggest that both women and men use sex to cope with emotional difficulties, but for different reasons and in different social/emotional contexts.

Thus, the gender differences noted in the YSEX?-15H study seem to be theoretically well justified. It is unclear, however, why a different pattern of gender differences exists between the 15-item and 73-item versions of YSEX? One possibility is differences in methodology between studies. Namely, due to the use of the redundancy analysis (Mokken & Lewis, 1982), the number of items excluded from each scale was not the same in both studies. It is possible that differences noted in the 73-item YSEX? were significant because it contained a higher number of items referring to the same motive, only with different wording. Accordingly, not all relevant aspects or traits had equal weight in forming the total score of the scale. As such, we believe the current measure is more accurate and measures without bias because every trait or aspect is measured with one item and within the scales, these are balanced.

Age Differences

The age differences previously obtained with the YSEX?-HSF (Meskó et al., 2022) were only partially replicated with the YSEX?-15H in the present study. Both studies found a significant positive association between Personal Goal Attainment and participants' age. Older participants as compared to younger ones consistently assigned higher importance to self-focused reasons for engaging in sexual activity; nonetheless, the extremely low correlation obtained in the present study provided only weak evidence for this. Both studies found a significant negative correlation between Relational Reasons and age; younger participants were more sexually motivated than older ones by factors influencing developments in their intimate partner relationships. These results corroborate the findings previously obtained with the YSEX?-HSF (Meskó et al., 2022), and they are also consistent with other related findings, which show that while sexual motivation in young adulthood may serve as a means to find an intimate partner,

it primarily contributes to individual partners' quality of life at older ages when reproduction-related goals are no longer central to them (e.g., Gewirtz-Meydan & Ayalon, 2019; Gray et al., 2019; Hatfield & Rapson, 2015; Klusmann, 2002; Purnine & Carey, 1998; Wyverkens et al., 2018).

External Validity Assessment

The tertiary aim of the present study was testing the external validity (#1) of the YSEX?-15H with self-report measures of the functional aspects of attachment and sexuality. While Personal Goal Attainment as a sexual motive showed negligible (albeit statistically significant) associations with several dimensions of attachment and partner relationship intimacy (i.e., $r < |.2|$; Ferguson, 2009), more substantial correlations were found for Sexual Hyperactivation, Attachment Avoidance and Anxiety and Relationship as Secondary. These findings suggest that self-focused sexual motivation is related to both secondary strategies of the sexual system, that is, Sexual Hyperactivation and Sexual Deactivation. This is in line with previous findings on the relationship between self-focused sexual motivation and one's willingness to engage in transactional sex (Birkás et al., 2020; Láng et al., 2021) and on the moderator role of Attachment Avoidance in terms of the impact of self-esteem and intrinsic/extrinsic motivation on one's openness to transactional sex (Ipolyi et al., 2021). This moderator effect of the Attachment Avoidance realized in different way in the younger and older age groups. In the case of younger respondents, the Attachment Avoidance moderated the effect of self-esteem on the acceptance of sugar relationships: the negative effect of self-esteem decreased to zero with increasing Attachment Avoidance. Furthermore, attachment avoidance moderated the negative effect of intrinsic motivation on the acceptance of sugar relationships (sexual encounter between an older and a younger party in exchange for material benefits), that is, the effect of intrinsic motivation decreased with increasing Attachment Avoidance. For older participants, attachment avoidance moderated the positive effect of extrinsic motivation on the acceptance of sugar relationships, that is, the effect of extrinsic motivation decreased with increasing Attachment Avoidance. These motivational aspects of short-term mating strategies are clearly associated with attachment and sexual system functionality, which may be adequately explained in an evolutionary approach (e.g., Mikulincer & Shaver, 2012; Shaver & Mikulincer, 2006; Simpson & Belsky, 2008).

Relational Reasons as a sexual motive also showed negligible positive correlations with several relationship and attachment dimensions. The lack of larger associations suggests that relationship-focused sexual motivation is related to secure attachment, which is consistent with previous findings showing that the sexual system ceases to be active if and when the primary

strategy is successful (e.g., Birnbaum & Reis, 2019; Shaver & Mikulincer, 2006; Szepsenwol et al., 2013). This implies that securely attached partners are likely to enjoy a satisfying sex life in a mutually committed relationship.

Sex as Coping had both negligible and more substantial significant positive correlations with the employed external measures, which suggest that one's tendency to deal with emotional problems by engaging in sexual activity is related to the secondary strategies of sexual and emotional functioning such as sexual hyperactivation and insecure attachment. These results comport with previous findings obtained with a different methodology, such as the association between hyperactivation and short-term mating interest (Birnbaum et al., 2014), and the association between anxious attachment and commitment to a relationship with negative emotional outcomes, which is due to the congruence of these outcomes with anxiously attached partners' attachment goals (e.g., Birnbaum, 2018; Davis et al., 2004). Note that the construct measured by the Sex as Coping scale is not identical with either secondary strategy of relationship attachment (Attachment Anxiety and Avoidance) or the secondary functioning of the sexual system (Sexual Hyperactivation or Deactivation). It is more likely, as suggested by the obtained findings, that this type of sexual motivation (Sex as Coping) is related to both alternative secondary strategies, which suggests that the sexual motivation used as a coping strategy may be related to insecure attachment itself.

A final aim of the present study was to test the external validity (#2) of the YSEX?-15H using a measurement of sexual strategies (SOI-R) and a five-factor personality construct (BFI-S). Results showed that the longer version (YSEX?-HSF) and the shorter version (YSEX?-15H) of these questionnaires are similarly related to sociosexuality and the five-factor personality model. Specifically, correlations of acceptable strength (correlation coefficient above 0.2; Ferguson, 2009) show a very similar pattern (same direction, similar in strength) for both instruments for the SOI-R scales. For correlations that are not acceptably strong (correlation coefficients below 0.2; Ferguson, 2009), a slightly different pattern is seen. This implies that unrestricted sociosexuality has a (positive) correlation with only one YSEX? scale (Personal Goal Attainment) and no meaningful strength of association with the others. This correlation holds for both measures. For the five-factor personality model (BFI-S) and sexual motivation (YSEX?), no correlations of acceptable strength (correlation coefficient above 0.2; Ferguson, 2009) were found for either measure. However, the pattern (strength and direction) of correlations between the five-factor personality model and sexual motivation is very similar (in fact, with one exception, identical) for both measures. Overall, the patterns of correlations for both instruments are similar in strength and in the same direction (Meskó et al., 2022). These results

confirm provides some evidence for the validity of the new brief instrument for research aimed at measuring sexual motivation.

Conclusion

The strength of the YSEX?-15H lies in its brevity. It has not been designed to provide comprehensive assessment of the large number of broad and specific sexual motives captured by the long form of the instrument. Nevertheless, it enables researchers to obtain a limited, but manageable scale of major dimensions of sexual motives (in larger samples) and to assess their associations with other psychological functions. It can be optimally used in studies for which time constraints require brief instruments, as part of a large test battery, and in any study that requires either the assessment or control of broad sexual motives. The YEX?-15H may also be useful as an assessment tool in clinical settings where an understanding of client's sexual motivation may be beneficial for guiding and assessing therapy goals. The YSEX?-15H offers a time-efficient means of assessing one's fundamental sexual motives.

The instrument has several limitations. First, the self-report methodology used in the present study was based on the assumption that respondents had conscious access to their sexual motives, which is not necessarily true in all cases. Second, data obtained with self-report measures might be distorted by social desirability effects: respondents might suppress socially undesirable responses (e.g., having sex with someone to punish the partner, giving sex for money etc.), whereas they might show a bias toward socially desirable responses (e.g., having sexual contact to express positive emotions toward the partner, being driven by love etc.). Third, although the overall sample used in the study was large and relatively heterogeneous, it was not tested for representativeness. For example, the samples may not have included asexual respondents, who are likely to be uninterested in a study on sexual motivation. Fourth, no data on the participants' sexual orientation was collected, thus the study enables no conclusions on the associations between sexual orientations and sexual motivation. Exploration of the possible associations is a subject of future research.

Data Availability Statement

The data that support the findings of this study are available at: https://osf.io/qbjkm/?view_only=fd6b38d0f0b0400e83b0a71e5661e64f.

Notes

1. We transformed the scales in order to conduct parametric tests instead of nonparametric ones and to ensure the comparability of the results across scales. The transformation

affects the actual scores; thus, statistical tests aiming to compare means of the scales would not have been possible to be used (but that was not a goal in this study).

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Contributions

Norbert Meskó: Conceptualization, Writing—Original draft preparation, Funding acquisition, Supervision. András N. Zsidó: Data curation, Formal analyses, Methodology; Béla Birkás: Methodology, Writing—Reviewing and Editing; Cindy M. Meston: Writing—Reviewing and Editing; David M. Buss: Writing—Reviewing and Editing.

Conflict of Interest

The authors have no known conflict of interest to disclosure.

Ethical Approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the Hungarian United Ethical Review Committee for Research in Psychology under Reference No. 2017/21 and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Supplementary Materials

Supplement 1 *H coefficient and relevant statistical values for each item pair that reached the cut-off of H > 0.5 in the redundancy analysis*

Items		H coefficient
49	50	0.53078
50	**51**	0.55211
52	53	0.72874
52	**54**	0.67191
53	**54**	0.70104
55	56	0.63891
55	67	0.52820
58	59	0.67630
58	60	0.69159
59	60	0.72821
61	62	0.69951
61	63	0.71942
62	63	0.77343
63	**70**	0.49632
64	67	0.50466
68	**69**	0.49514
71	72	0.76481
71	73	0.71701
72	73	0.78712

Note: Retained items are in bold. Please note that some items appeared in more than one redundant pairs, therefore entire pairs were removed in some cases.

Supplement 2 *The a parameter values for all items in the item response analysis with 95% confidence intervals (CI), separately for scales*

			95% CI	
Scale	**Item**	**a parameter**	**Lower**	**Upper**
Personal	11	.9577149	.8814529	1.033977
Goal	5	1.00501	.9163066	1.093714
Attainment	10	1.072817	1.007904	1.137729
	7	1.170568	1.080648	1.260488
	8	1.188097	1.082964	1.29323
	14	1.269071	1.164765	1.373377
	12	1.319158	1.246438	1.391879
	15	1.358502	1.246337	1.470668
	9	1.414178	1.311536	1.51682

	21	1.449461	1.359123	1.5398
	2	1.475539	1.401277	1.5498
	24	1.480464	1.397547	1.56338
	3	1.481202	1.403147	1.559258
	6	1.492923	1.381274	1.604571
	4	1.497385	1.374796	1.619973
	13	1.576144	1.451406	1.700881
	1	1.692765	1.613428	1.772103
	22	1.700189	1.614859	1.785519
	23	1.705566	1.621056	1.790075
	17	1.709202	1.628638	1.789767
	19	1.843504	1.732039	1.954968
	16	1.848916	1.763653	1.934179
	18	1.890214	1.802614	1.977814
	20	2.035471	1.903382	2.16756
Relational	38	1.012541	.952492	1.07259
Reasons	43	1.094396	1.021148	1.167644
	31	1.106532	1.044689	1.168375
	28	1.124487	1.062111	1.186863
	37	1.148148	1.077108	1.219188
	40	1.172825	1.109623	1.236027
	25	1.210439	1.144941	1.275937
	32	1.352172	1.2836	1.420744
	44	1.392915	1.31402	1.471809
	35	1.412628	1.341806	1.483451
	29	1.419784	1.348658	1.490911
	41	1.444418	1.37447	1.514366
	34	1.460562	1.386099	1.535025
	42	1.463991	1.391683	1.536299
	46	1.4781	1.40576	1.55044
	26	1.480088	1.402765	1.55741
	30	1.491286	1.417139	1.565432
	33	1.495467	1.423208	1.567726
	45	1.514029	1.440507	1.587551
	48	1.515803	1.441366	1.59024
	47	1.535175	1.460633	1.609716
	27	1.577565	1.499548	1.655582
	36	1.662356	1.58412	1.740591
	39	1.691879	1.609208	1.77455
Sex	51	.6376148	.5787485	.6964811
as	49	.682814	.6220311	.743597
Coping	54	1.241516	1.165124	1.317908

55	1.250032	1.169736	1.330328
58	1.289941	1.156719	1.423163
57	1.437957	1.331886	1.544029
65	1.469406	1.379691	1.559121
69	1.528028	1.412319	1.643737
66	1.535019	1.446408	1.623631
61	1.611808	1.517178	1.706438
71	1.636794	1.543306	1.730282
70	1.677061	1.574313	1.77981
64	1.709818	1.590325	1.829312

Note: Retained items are in bold.

Supplement 3 *Reasons for Having Sex Questionnaire, Hungarian 15-item Version (YSEX?-15H) in English*

YSEX?-15H

People have sex (i.e., sexual intercourse) for many different reasons. Below is a list of some of these reasons. Please indicate how frequently each of the following reasons led you to have sex in the past. For example, if about half of the time you engaged in sexual intercourse you did so because you wanted to celebrate, then you would circle “3” beside question 14. If you have not had sex in the past, use the following scale to indicate what the likelihood that each of the following reasons would lead you to have sex.

I have had sex in the past because...

1	2	3	4	5
None of my sexual experiences	A few of my sexual experiences	Some of my sexual experiences	Many of my sexual experiences	All of my sexual experiences

1. I wanted to seek experience.
2. I wanted pleasure.
3. I wanted to apologize.
4. It was a seduction/I was seduced.
5. I wanted to recharge myself.
6. I wanted to submit myself.
7. I took the opportunity.
8. Out of passion.
9. I wanted to prove sg to my partner.
10. I wanted to control the other person.
11. I wanted to cheer up the other person.
12. I wanted to comfort the other person.
13. I wanted to demonstrate my power.
14. I wanted to celebrate.
15. I wanted to retain the relationship.

Note: Personal Goal Attainment: 1, 4, 7, 10, 13. Relational Reasons: 2, 5, 8, 11, 14. Sex as Coping: 3, 6, 9, 12, 15.

Supplement 4 *Reasons for Having Sex Questionnaire, Hungarian 15-item Version (YSEX?-15H) in Hungarian*

Miért szexel ön? kérdőív (YSEX?-15H)

Az ember számos okból létesíthet szexuális kapcsolatot valakivel (pl. közösül). Az alábbiakban egy listát talál majd, amelyen ilyen okok szerepelnek. Kérjük, valamennyi esetben jelölje meg, hogy Önnél milyen gyakran vezettek ezek az okok a múltban ahhoz, hogy valakivel szexeljen. Például, ha egy adott ok egyáltalán nem volt jellemző az ön eddigi szexuális életére akkor jelölje meg a kérdés mellett a "1"-as számot. Ha azonban nagyon gyakran vezetett egy adott ok ahhoz, hogy Ön szexeljen, akkor jelölje meg az "5"-ös számot. Ha nem közösült még életében, akkor azt jelölje a számokkal, hogy milyen okok vezetnék Ön ahhoz, hogy szexeljen (ha ezt tenné).

Azért szexeltem, mert:

1	2	3	4	5
Egyáltalán nincs ilyen szexuális tapasztalatom	Van néhány ilyen szexuális tapasztalatom	Jópár ilyen szexuális tapasztalatom van	Elég sok ilyen szexuális tapasztalatom van	Nagyon sok ilyen szexuális tapasztalatom van

1. élménykeresés miatt
2. vágytam a gyönyörre
3. bocsánatkérésként
4. csábítás volt
5. feltöltődés miatt
6. behódolás miatt
7. éltem a lehetőséggel
8. szenvedélyből
9. bizonyítás a partnernek
10. uralkodni akartam a másik felett
11. fel akartam vidítani a másikat
12. vigasztalásból
13. demonstrálni akartam a hatalmam
14. ünneplés miatt
15. kapcsolat megtartása miatt

Megjegyzés: Személyes célok elérése: 1, 4, 7, 10, 13. Kapcsolati okok: 2, 5, 8, 11, 14. Szex mint megküzdés: 3, 6, 9, 12, 15.

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2.4 Sex and Relationship Differences on the Short Love Attitude Scale: Insights from the Hungarian Adaptation[4]

Norbert Meskó[1*], András N. Zsidó[1], András Láng[2], Kázmér Karádi[3]

[1]Department for General and Evolutionary Psychology, Institute of Psychology, University of Pecs, Pécs, Hungary

[2]Department for Developmental and Clinical Psychology, Institute of Psychology, University of Pecs, Pécs, Hungary

[3]Department of Behavioural Sciences, Divison of Clinical Behavioural Sciences, University of Pecs, Pécs, Hungary

* Corresponding author

Abstract

Love styles are attitudes towards romantic relationships that are related to sexual motivation, sociosexuality, mate value, and relationship status. In the present study, the Short Love Attitude Scale (LAS-SF) was adapted to Hungarian, and the original factor structure was replicated with a Hungarian sample of 800 participants (439 females, mean age = 38.6 years). The results show that the Hungarian LAS-SF is a reliable and valid measure, which enables cross-cultural comparisons. Differences in love styles were revealed across sexes and relationship statuses. All men except singles scored relatively high on Eros, while the highest Eros scores among women were obtained for those in a committed relationship. Women and men preferred the same strategy (Ludus) to achieve short-term relationship goals.

Keywords: Love Attitude Scale, sex differences, relationship status, Hungarian version.

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Introduction

Love Attitudes

In an earlier work, Lee (1973) used the analogy of a colour wheel to illustrate his typology of love. This model comprises three "primary colours", that is, three primary love types such as Eros (passionate, romantic love), Ludus (playful, uncommitted love), and Storge (friendly love). Secondary love types are defined as balanced mixtures of the three primary types: Pragma (practical, rational love) is a combination of Storge and Ludus, Mania (obsessive or addictive love) is a combination of Eros and Ludus, and Agape (altruistic or unselfish love) is a combination of Eros and Storge. Thus, the model defines six different love types, which are used to describe individual differences in love (e.g., Raffagnino and Puddu 2018). This typology provides a relatively complex and comprehensive classification, which is consistent with everyday experience and language (Hendrick and Hendrick 2006).

Following the model proposed by Lee (1973, 1988), some researchers made efforts to develop a measuring instrument enabling them to verify the validity of the theory and to explore the relationship between various love styles and other variables (e.g., personality traits; Laswell and Laswell 1976). The instrument became eventually known as the Love Attitudes Scale (LAS; Hendrick and Hendrick 1986; 1990). During the analysis process six love style scales emerged clearly from factor analysis and later replicated the factor structure, factor loadings, and reliability. Internal reliability was shown for each scale, and the scales had low intercorrelations with each other. The significant relationships between love attitudes and sex, previous love experiences, current love status, and self-esteem. Subsequently, the original LAS questionnaire was used in a number of studies (e.g. Bailey et al. 1987; Hendrick and Hendrick 1990; Hendrick 1988; Hendrick and Adler 1988; White et al. 2004). A short version of the LAS was also developed subsequently, whose 24 items showed better psychometric properties than the original full version (Hendrick and Dicke 1998). This means that increased inter-item correlations (compare to the 7-item subscales) maintained the strength of the alphas, despite subscale length was reduce from seven to four items.

In addition to the development of different versions of the LAS, critical voices also emerged that considered the results of the questionnaire with confirmatory factor analysis unacceptable (Rotzien et al. 1994).

Another line of research has found biological evidence for the basic premise of human love styles. Emanuele at al. (2007) found a significant association between the DRD2 TaqI A genotypes and Eros, as well as between the C516T 5HT2A polymorphism and Mania. These

associations were present in both sexes and remained significant even after adjustment for potential confounders. This means that the functioning of the human neuroendocrinological system is related to the type of love individual experiences: different neurotransmitter genes are activated in different love styles.

Over recent years, the scale has been adapted for, and used in, various cultures including Chinese (Yang and Liu 2007), Malaysian (Wan Shahrazad et al. 2012), Turkish (Bugay and Tezer 2008), Italian (Agus et al. 2018), Portuguese (Neto 1993), and French samples (Neto et al. 2000).

Sociosexuality

The term sociosexuality was originally used to describe the diversity of sexual behavior in men and women. (Jonason 2019). Simpson and Gangestad (1991) initially developed a measure of individual differences in attitudes and behavior towards casual sex, while Penke and Asendorpf (2008) added sociosexual desire to the original construct and measure. According to Jackson and Kirkpatrick (2007), sociosexuality comprises short-term and long-term mating interest, and past sexual behavior. Existing empirical findings on the psychological contexts of sociosexuality suggest that men are more willing to engage in casual sex than women, which applies globally (Lippa 2009; Schmitt, 2005). Furthermore, unrestricted socio-sexuality is associated with maximizing mating efforts, while restricted sociosexuality is more closely associated with parental efforts (Valentova et al. 2020). Finally, unrestricted sociosexuality is positively correlated with openness to casual sex among users of online dating sites (Hallam et al. 2018). However, one study concludes that unrestricted sociosexuality predisposes to extradic casual sex only when accompanied by a low level of commitment to a long-term partner (Rodrigues and Lopes 2017).

Neto (2015; see also Marzec and Łukasik 2017) found that sociosexuality was negatively associated with Eros among both men and women (overall = − 0.21, $p < 0.001$; men = − 0.23, < 0.001; women = − 0.21, < 0.01). This suggests that individuals restricted in sociosexuality are more likely to pursue erotic love as compared to unrestricted ones. Those characterized by Eros prefer strong physical attraction, emotional intensity, a popular physical appearance, and a sense of inescapability of the relationship (Hendrick and Hendrick 2006). Another central feature of this style is the preference for relatively close and exclusive love relationships. Furthermore Neto (2015) found also sex differences in the strengths of associations between sociosexuality and love styles. The difference between males' and females' correlations on Ludus ($p < 0.001$), Pragma ($p < 0.001$), Mania ($p < 0.001$), Agape ($p < 0.05$).

Love, Sex, and Life History Theory

Frey and Hojjat (1998) explored measurable associations between love attitudes and preferences for various sexual scripts. They found that all love attitudes correlated positively with a preference for commitment except Ludus, with which commitment showed a negative correlation. These results were corroborated by subsequent findings that revealed a positive association between a game-playing love style (Ludus) and unrestricted sociosexual orientation (e.g., Jonason and Kavanagh 2010; Lee et al. 2013; Proyer et al. 2018; Smith et al. 2019).

According to the Life History Theory (Belsky et al. 1991; Kaplan et al. 2005) behavioral adaptation to various environmental (ecological and/or social) conditions encountered during childhood is regulated by a wide variety of different traits resulting in various behavioral strategies (see Csathó and Birkás, 2018). LH strategies are resource allocation patterns including trade-offs configured to adjust resource utilization to local conditions and to optimize adaptive behavior such as mating or parental investment (Bjorklund and Ellis 2014; Ellis et al. 2009). These resource expenditure sequences may be positioned on a dimension of slow to fast strategies (Del Guidice et al. 2015). Slow LH strategies are characterized by the ability to delay gratification, future/long-term focused behavioral strategies, and better quality of parental care (i.e., larger investment of time and effort in each offspring). By contrast, individuals with faster LH strategies possess a more present/short-term oriented attitude including opportunistic, impulsive and self-beneficial behaviors, higher frequency of mating with an early start, and little investment in social relationships and in the offspring (Griskevicius et al. 2011; Nettle 2010).

Some of the more recent studies suggest that the relationship between love and sexuality essentially depends on the quality of the partners' relationship, which is interpreted in a biological-evolutionary framework. Findings reported by Marzec and Łukasik (2017) showed that the Ludus love style was associated with a fast life history (LH) strategy while Eros with a slow LH strategy. LH strategies are resource allocation patterns including trade-offs configured to adjust resource utilization to local conditions and to optimize adaptive behavior such as mating or parental investment (Bjorklund and Ellis 2014; Ellis et al. 2009; Kaplan and Gangestad 2005). These resource expenditure sequences may be positioned on a dimension of slow to fast strategies (Del Guidice et al. 2015). Slow LH strategies are characterized by the ability to delay gratification, future/long-term focused behavioral strategies, and better quality of parental care (i.e., larger investment of time and effort in each offspring). By contrast, individuals with faster LH strategies possess a more present/short-term oriented attitude including opportunistic, impulsive and self-beneficial behaviors, higher frequency of mating with an early start, and little investment in social relationships and in the offspring (Griskevicius et al. 2011; Nettle 2010; Belsky et al. 1991).

From the perspective of the Life History Theory, the Ludus love style is part of a fundamentally goal-directed mating strategy focused on opportunities of maximizing resources (Marzec and Łukasik 2017). This means that although Ludus cannot be equated with one-on-one short-term relationship and sexual functioning, it can still be said to be an emotional component of the same mating strategy.

Sexual Motivation

Sexual motives have been described as the conscious and subjective reasons stated by men and women for engaging in sexual activity (e.g. Hatfield et al. 2012; Meston and Buss 2007; Meston and Stanton 2017). Sexual activity is influenced by a number of biopsychosocial factors as well as by contextual factors of the relationship such as the type and/or duration of the relationship, and partners' attachment style (Meston and Stanton 2017). Several studies revealed sex differences in sexual motivation (e.g., Meston and Buss 2007; Meston et al. 2009,2019), which show that women primarily have relationship-related reasons as opposed to men who are more likely to report self-focused reasons. Armstrong and Reissing (2015) explored the effects of relationship type on sexual motivation. Their results revealed that physical motives were more pronounced in those preferring casual sexual relationships, whereas those having a committed relationship showed stronger emotional motives. Engaging in casual sex does not require an emotional attachment, since partners are not motivated to commit themselves to each other in a long-term relationship and reap the benefits of commitment. Meskó et al. (2019) developed the Hungarian Short Form of the Reasons for Having Sex Questionnaire (YSEX?-HSF) which revealed marked sex and age differences in sexual motivation. The YSEX?-HSF showed a factor structure different from that of the original American version of the questionnaire (Meston and Buss 2007): the former is composed of three primary factors comprising 24 subfactors; the latter consists of four primary factors and 13 subfactors. Despite the differences between factor structures, the composition of reasons for having sex are highly similar in the two factors. This finding points to both the cross-cultural universality of human sexual motivation, and also the cultural diversity reflected in the differences between the two factor structures. Initial results with the YSEX?-HSF indicated, that self-centered and stress-related motives for sex were positively associated with unrestricted sociosexuality.

Sex Differences

Studies on romantic love and sexuality frequently raise the issue of sex differences in love styles (for a review, see, e.g., Raffagnino and Puddu 2018; Zeigler-Hill 2015). Existing findings suggest that men ($N = 444$) tend to have higher levels of Ludus than women ($N = 646$) (2.64 vs. 2.12; $p < 0.001$; $F = 98.51$) while women report higher levels of Mania (3.10 vs. 2.94; $p < 0.01$;

F = 8.98), Storge (3.69 vs. 3.42; $p < 0.001$; F = 23.49) and Pragma (2.96 vs. 2.71; $p < 0.001$; F = 17.78) than men (e.g., Hendrick and Hendrick 1995). Hendrick (1984) found that women were more pragmatic, storgic, and manic in their love attitudes, while men's love styles tended to be more erotic and ludic. This means that men tend to hold romantic beliefs and attitudes that are consistent with eroticism and playfulness. By contrast, women are more likely to build relationships based on practical love and a sense of despair. These sexually divergent love patterns are generally consistent with the sex differences found by researchers in the mating context. For example, it is known from previous research that men are more likely than women to consider engaging in short-term sexual encounters (e.g., Clark and Hatfield 1989), while women are more likely to regret casual sex if they do participate at all (Kennair 2018). Another marked sex difference is that women often tend to be somewhat more selective than men when considering partners for various types of romantic relationships (e.g., Buss and Schmitt 2019). Sex differences in love, mate preferences and sexuality reflect, on one hand, the social structures that influence male and female sexual behavior (e.g., Eagly and Wood 1999), and, on the other hand, well demonstrate the fundamental psychological characteristics of sexual psychology of men and women (Ohno 1967; Walsh 1993), which is thought to be the result of differences in physical reproductive mechanisms and parental investment (Trivers 1972).

Mate Value

One's mate value is an indicator informing potential partners about one's inclusive fitness in a mate choice context (Howie and Pomanowski, 2018). Broadly speaking, one's mate value is one's attractiveness as perceived by potential partners of the opposite sex. Mate value is based on a set of characteristics such as, for example, fertility, intelligence, social status, access to resources, and willingness to make parental investments (e.g., Buss 1989; Kirsner et al. 2003). The relevant indicators of mate value show considerable sex differences. Men assign relatively high priority to potential female partners' young age and fertility, while women tend to focus on men's social status, intelligence, access to resources, and willingness to make parental investments (e.g., Buss 2006; Buss and Schmitt 1993; 2019; Conroy-Beam et al. 2019; Walter et al. 2020). As a result of these differences in the perception of mate value indicators, the mate value possessed by different individuals also shows considerable variety. Those having a higher mate value are less restricted in pursuing and optimizing their sexual strategy (e.g., Rhodes 2005; Simpson and Gangestad, 1992). In fact, a positive relationship was found between physical attractiveness and the number of sexual partners irrespective of participants' sex (e.g., Thornhill and Gangestad 1994). Thus, mate value has an impact on the availability and optimizability of various sexual strategies and thereby on reproductive fitness. Several self-report

measures of mate value have been developed (e.g., Edlund and Sagarin 2014; Fletcher 1999; Kirsner 2003), whose items partly overlap, albeit being based on different theoretical conceptualizations. In a recent study, Gillen et al. (2016) revealed positive correlations between mate value of the respondent's partner (this had to be assessed by the respondent) and the respondent's self-reported love style, although significant (low or medium) correlations were found only in Eros and Pragma. To the knowledge of the authors, there is no research aimed at exploring the relationships between love styles and mate value.

Relationship Status and Age Differences

Previous cross-sectional studies found that various relationship statuses were associated with different love styles. Richardson (1988) revealed that participants currently involved in an intimate partner relationship scored higher on the Eros love style than those who reported on a past or anticipated relationship. Furthermore, those who completed self-report measures in the context of a past relationship scored higher on Mania than those who reported on an anticipated relationship. Only marginal effects were obtained for Ludus, which might be the case in part because the authors did not assess short-term relationship statuses (e.g., one-night stand, casual sex, fling) in addition to the distinction between current, past and anticipated relationships. In an earlier study, which included an assessment of participants' preference for short-term relationships, Morrow (1995) found that casual daters and married individuals scored significantly lower on Eros than those who were dating regularly, cohabiting or engaged, irrespective of participants' sex. Furthermore, female casual daters were more likely to endorse Ludus than women who were dating regularly or engaged.

These findings point to the methodological importance of assessing participants' preference for short-term relationships in studies focusing on the associations between relationship statuses and love styles. In the 1980s and before, researchers probably followed moral considerations when choosing not to include short-term relationship statuses in the available response alternatives. Subsequent studies assessed dating frequency (casual vs. regular dating; e.g. Morrow et al. 1995), which, however, did not enable researchers to make a distinction between currently single participants and those preferring casual sexual relationships. Researchers adopting a different methodological approach assessed the duration of participants' relationships (e.g., Ahmetoglu et al. 2010). While duration may indeed be positively associated with the depth of a relationship, it does not necessarily reflect the level of commitment. Hadden et al. (2019) point out that the more seriously partners take their relationship, the more committed and satisfied they are, and the larger emotional and/or material investments they are willing to make.

Previous research on love styles generally did not address possible age differences (e.g., Davies 1996; Frey and Hojjat 1998; Gana 2013; Lacey et al. 2004; Neto 2015; Neto et al. 2000). Not even a meta-analysis encompassing 22 studies (including other meta-analyses) found any empirical results on the relationship between age and love styles (Raffagnino and Puddu 2018). Nevertheless, preferences for various love styles are very likely to develop and change over time, and therefore they probably vary with age, but this relationship may not be reliably assessed in a cross-sectional design. Instead, the subject requires longitudinal studies enabling researchers to reveal the effects of maturation and behavioral development in intimate partner relationships as pointed out by Hammock and Richardson (2011).

The primary aim of the present study was to develop and validate the Hungarian version of the Short Love Attitude Scale. A secondary aim of the study was to replicate the original factor structure with a Hungarian sample. To obtain cross-culturally comparable data, the same scales were used for psychometric analysis as those used in the development of the original LAS-SF and its various national versions. The third aim of our study is to find a relationship between love styles and age, and between love styles and relationship status.

Hypothesis, Predictions, and Research Aims

Hypothesis As the Love Attitude Scale is a research tool in which the six factors are not the result of a traditional test development procedure, but are based on Lee's theory, we assume that the primary goal of the Hungarian adaptation is to verify this theoretically grounded, original factor structure. The Hungarian adaptation of LAS-SF (LAS-HSF) was expected to show adequate psychometric properties and validity, similarly to the original version and its previously published adaptations (Agus et al. 2018; Bugay and Tezer 2008; Hendrick and Dicke 1998; Neto 1993; Neto et al. 2000; Wan Shahrazad et al. 2012; Yang and Liu 2007).

Prediction 1–Reliability The LAS-HSF was expected to show good psychometric properties and a factor structure identical with that of the original version (Hendrick and Dicke 1998).

Prediction 2–Validity The love style measures were expected to show associations with sociosexuality, sexual motivation and mate value consistent with those obtained in previous studies (see, respectively, Neto 2015; Armstrong and Reissing 2015; Zeigler-Hill et al. 2015). We predict that sociosexuality is negatively correlated with Eros (Neto 2015). In other words, individuals more open to casual contact (more unrestricted sociosexuality) report lower Eros scores. To the best of our knowledge, the relationships between sexual motivation and love attitudes have not been studied before. Therefore, we can only base it on the results of research

that has partly asked similar questions (Armstrong and Reissing 2015; Meskó et al 2019). Based on the negative correlation between self-esteem and Mania (Zeigler-Hill et al. 2015), we expected Mania to be negatively correlated with self-perceived mate value.

Research aim In consistence with the above discussed theoretical considerations, participants' preferences for various love styles were expected to vary with their relationship status (e.g., single, engaging in casual sexual relationships, living in a committed relationship, married). From a broader theoretical perspective, one's love style (i.e., the specific pattern of cognitive, affective and behavioral components of one's attitude towards one's sexual partner) was hypothesized to be part of one's underlying mate choice strategy, whose manifestation was expected to vary with sex (e.g., Eagly and Wood 1999; Ellis 1992; Naftolin 1981), age (e.g., Fawcett and Johnstone 2003), and relationship status (e.g., Buss 1989; Conroy-Beam et al. 2019; Walter et al. 2020). This part of the study is explicitly exploratory, thus, no predictions were formulated.

Method

Procedure and Participants

The authors first translated the items of, and instructions for, the LAS-SF into Hungarian, and the obtained Hungarian version was verified with the standard back-translation technique (Brislin 1980). Specifically, the items and instructions were retranslated into English by an independent translator unaffiliated with the study, and the two translators then resolved minor discrepancies that emerged during the back-translation procedure.

The sample included 800 voluntary participants (361 males and 439 females) aged 18 to 69 years (M = 38.6, SD = 12.5). According to the reported relationship statuses, 120 participants were single, 60 had casual sexual relationships (or flings), 176 were involved in a committed relationship, and 444 were married. Data were collected online. The survey was edited in Google Forms. The link to the survey was disseminated via Facebook and via one of the most popular and influential Hungarian internet portals, Index (https://index.hu/). All participants gave informed consent, and none of them was rewarded for participation. The study received ethical approval as part of a larger research project on mating strategies from the Hungarian United Ethical Review Committee for Research in Psychology (Ref. No. 2018/115).

Measures

Love Attitudes Scale, Short Form (LAS-SF; Hendrick and Dicke 1998). The LAS-SF contains 24 items, which compose the following six subscales: Eros (erotic, romantic, passionate love style), Ludus (game-playing love style), Storge (affectionate, friendship-oriented love

style), Pragma (rational, shopping-list love style), Mania (possessive, dependent love style), and Agape (selfless love style). Each subscale has four Likert items, and respondents indicate the extent to which each item applies to them on a 5-point rating scale ranging from 1 (strongly disagree) to 5 (strongly agree). Thus, higher scores reflect higher preference for the specific love style. Detailed data on the internal consistency of the scale are presented in the *Results* section.

Sociosexual Orientation Inventory, Revised (SOI-R; Penke and Asendorpf 2008; adapted to Hungarian by Meskó et al. 2014). The SOI-R comprises nine items assessing one's willingness to engage in uncommitted sexual encounters. The items compose three subscales measuring the three components of behavior, attitude and desire. Responses are given on 9-point rating scales (scale anchors vary across items). Higher scores on each subscale indicate more unrestricted sociosexuality in terms of behavior, attitude and/or desire. Cronbach's α values for the three subscales and the overall scale were as follows: Behavior: 0.87; Attitude: 0.83; Desire: 0.90; SOI-R (overall): 0.88.

Reasons for Having Sex Questionnaire, Hungarian Short Form (YSEX?-HSF; Meskó et al. 2019). The YSEX-HSF is a self-report instrument similar to the original questionnaire in item composition and slightly different in factor structure which characteristics support both, the cross-cultural universality of human sexual motivation and also the cultural diversity (reflected in the differences of the factor structure). The questionnaire comprises 73 items, which compose the following three scales: Personal goal attainment, Relational reasons, Sex as coping. This differs from the original YSEX? (Meston and Buss 2007) four scales questionnaire. Each item is rated on a 5-point scale offering the following options: 1 = "None of my sexual experiences"; 2 = "Few (…)"; 3 = "Some (…)"; 4 = "Many (…)"; 5 = "All of my sexual experiences". Thus, higher scores reflect higher levels of the measured sexual motive. Cronbach's α values for the three scales were as follows: Personal goal attainment: 0.91; Relational reasons: 0.92; Sex as coping: 0.91.

Mate Value Scale (MVS; Edlund and Sagarin 2014; adapted to Hungarian by Csajbók et al. 2019). The MVS is a self-report measure assessing one's own value as a mate. Its four items show a unifactorial structure, it has good internal consistency and test–retest reliability as well as adequate convergent and discriminant validity. Each item is rated on a 7-point scale ranging from (1) extremely undesirable to (7) extremely desirable on two items, from (1) very much lower than average to (7) very much higher than average on one item, and from (1) a very bad catch to (7) a very good catch on one item. Cronbach's α for the MVS in the present study was 0.88.

Relationship status. The assessment of participants' relationship status followed the method used by Dush and Amato (2005) in that participants did not indicate the duration of their current relationship, but they defined their relationship status in terms of commitment to the partner (single, casual relationship, committed cohabitation, marriage).

Data Analysis

A confirmatory factor analysis (CFA) was run on the items of the LAS-HSF to test whether the original six-factor model would show the best fit indices. Cronbach's α coefficients were calculated for the subscales to assess their internal consistency.[Footnote 1]

Construct validity is the degree to which a test measures what it claims or purports to measure. It can be obtained in two ways: either by using special groups that the questionnaire should be able to differentiate between or by a statistical analysis of the relationship between two measures. We used relationship status as a grouping variable to examine whether the LAS-HSF subscales they would differentiate between participants with different relationship statuses. Convergent and discriminant validity are subtypes of construct validity. Providing evidence for both convergent and discriminant validity means by definition that evidence for construct validity has been given (Cronbach & Meehl, 1955). Convergent validity was tested with an analysis of correlations between the LAS-SF subscales and the YSEX?-HSF and SOI-R subscales, while the MVS was used to examine discriminant validity. Due to the number of correlations, correction for multiple comparisons seemed necessary. For this purpose, we used Bonferroni correction (the new alpha was 0.001).

Sex differences were examined with independent samples *t*-tests, while the possible effects of age were tested with correlation analyses. Possible interactions between sex and relationship status were examined with two-way ANOVAs. Where the interaction was nonsignificant, one-way ANOVAs were used to examine relationship status differences. The skewness and kurtosis values for the dependent variables in these analyses were between − 2 and + 2, and thus, can be considered acceptable in order to prove normal univariate distribution (Field 2000 and 2009; Gravetter and Wallnau 2014; Trochim and Donnelly 2006). Nevertheless, we also used nonparametric tests (i.e., Kruskal–Wallis and Mann–Whitney tests) to confirm the results. The results of these tests matched those of the parametric tests, therefore only the former results are presented below. The statistical analyses were conducted with the JAMOVI v. 1.0 for Windows (The Jamovi Project, 2020) application.

Results

Reliability of the LAS-HSF

The CFA indicated that the original six-factor model provided an excellent fit (CFI = 0.946, TLI = 0.936, RMSEA = 0.045 [90% CI: 0.041–0.049], SRMR = 0.043) on our sample. Descriptive data and the mean scores of the sample are also presented in Table 1. All six subscales showed good internal consistency. The fit indices of the model with covariances indicated an excellent fit of the model to our data (see Fig. 1). Cronbach's alpha value was 0.82 for the Eros subscale, 0.77 for the Ludus subscale, 0.87 for the Storge subscale, 0.64 for the Pragma subscale, 0.73 for the Mania subscale and 0.83 for the Agape subscale.

Table 1 *Mean scores, medians, and standard deviations of the six subscales of the LAS-HSF broken down by gender*

	Gender	Eros	Ludus	Storge	Pragma	Mania	Agape
Mean	**Male**	15.20	10.90	8.81	7.61	8.98	11.70
	Female	16.40	8.08	9.49	8.84	9.63	11.10
Median	**Male**	16	11	8	7	9	12
	Female	17	7	8	8	9	11
Std. Dev.	**Male**	3.63	4.35	4.31	3.08	3.61	3.82
	Female	3.26	3.96	4.83	3.64	3.96	3.95

Fig. 1 *Standardized six-factor structure of the Hungarian Short Love Attitude Scale (LAS-HSF) model*

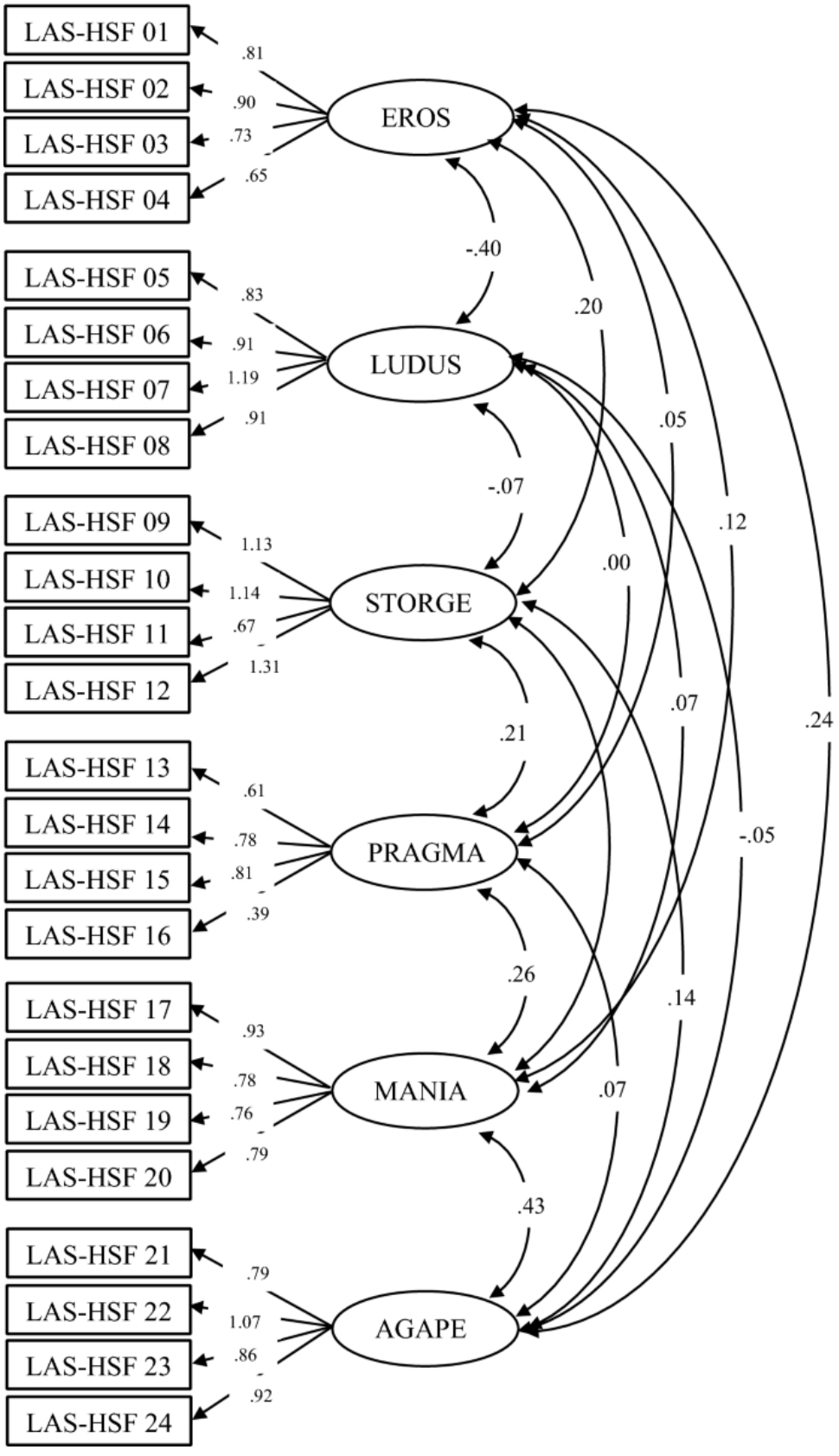


Table 2 *Correlations of the six subscales of the LAS-HSF with the three subscales and the total score of the Revised Sociosexual Orientation Inventory (SOI-R), with the total score of the Mate Value Survey (MVS), and with the three scales of the Hungarian Short Form of the Reasons for Having Sex Questionnaire (YSEX?-HSF)*

	Eros	Ludus	Storge	Pragma	Mania	Agape
SOI Behavior	-.169 ***	.467 ***	-.140 ***	-.032	-.066	-.134 ***
SOI Attitude	-.166 ***	.426 ***	-.120 ***	-.108 **	-.118 ***	-.136 ***
SOI Desire	-.300 ***	.497 ***	-.057	.009	.026	-.058
SOI Total	-.265 ***	.566 ***	-.118 ***	-.056	-.057	-.127 ***
MVS Total	.151 ***	.083 *	-.004	.142 ***	-.052	-.128 ***
YSEX Personal Goal Attainment	-.190 ***	.541 ***	-.056	.100 **	.124 ***	-.037
YSEX Relational Reasons	.108 **	.125 ***	.085 *	.180 ***	.187 ***	.127 ***
YSEY Sex as Coping	-.169 ***	.282 ***	-.015	.192 ***	.291 ***	.073 *

Note: * $p < .05$, ** $p < .01$, *** $p < .001$. According to the Bonferroni correction for multiple comparisons, the new alpha is .001, thus only *** results can be viewed as statistically significant.

Sex and Age Differences

We found sex differences across all six subscales with females scoring higher compared to males on the Eros subscale with a mean difference of 1.22 (95% CI = 0.74–1.69, t(798) = 4.99, p < 0.001, Cohen's d = 0.35), Storge subscale with a mean difference of 0.68 (95% CI = 0.03–1.32, t(798) = 2.06, p = 0.039, Cohen's d = 0.15), Pragma subscale with a mean difference of 1.23 (95% CI = 0.76–1.70, t(798) = 5.09, p < 0.001, Cohen's d = 0.36), Mania subscale with a mean difference of 0.65 (95% CI = 0.12–1.18, t(798) = 2.40, p = 0.017, Cohen's d = 0.17). Males scored higher compared to females on the Ludus subscale with a mean difference of 2.86 (95% CI = 2.28–3.44, t(798) = 9.74, p < 0.001, Cohen's d = 0.69) and Agape subscale with a mean difference of 0.57 (95% CI = 0.03–1.11, t(798) = 2.06, p = 0.039, Cohen's d = 0.15).

We also found sex differences on the total score and three subscales of SOI with males compared to females scored higher in every case. For total score the mean difference was 14.29 (95% CI = 12.22–16.36, t(798) = 13.33, p < 0.001, Cohen's d = 0.96), for the Behavior subscale the mean difference was 3.57 (95% CI = 2.69–4.46, t(798) = 7.95, p < 0.001, Cohen's d = 0.57), for the Attitude subscale the mean difference was 4.31 (95% CI = 3.42–5.20, t(798) = 9.49, p < 0.001, Cohen's d = 0.67), and for the Desire subscale the mean difference was 6.40 (95% CI = 5.55–7.25, t(798) = 14.79, p < 0.001, Cohen's d = 1.05). Females scored higher on MVS compared to males with a mean difference of 1.18 (95% CI = 0.62–1.74, t(798) = 4.13, p < 0.001, Cohen's d = 0.29). Further, males scored higher on the Personal Goal Attainment of YSEX with a mean score of 6.89 (95% CI = 4.72–9.06, t(798) = 6.24, p < 0.001, Cohen's d = 0.44). However, on the Sex as Coping subscales females scored higher than males with a mean score of 1.01 (95% CI = 0.95–4.92, t(798) = 2.91, p = 0.004, Cohen's d = 0.21). We found no difference between males and females on the Relationship Reasons subscale of YSEX.

Regarding the relationship of age and LAS-HSF subscales, the Spearman correlation showed rather weak relationship across four of the six subscales: Eros (rho = − 0.19, p < 0.01), Ludus (rho = 0.27, p < 0.01), Storge (rho = − 0.06, p = 0.086), Pragma (rho = − 0.13, p < 0.01), Mania (rho = − 0.08, p = 0.028) and Agape (rho = − 0.04, p = 0.29).

Relationship Status

The interaction between relationship status and sex was significant for the Eros (F(3, 792) = 2.87, $p = 0.036$, $\eta_p^2 = 0.01$) and the Ludus (F(3, 792) = 3.46, $p = 0.016$, $\eta_p^2 = 0.01$) subscales. The interaction on the other four subscales were nonsignificant (Fs < 1, ps > 0.1). For the Eros subscale, follow-up one-way ANOVAs revealed different patterns for the relationship

status. In males ($F(3, 357) = 4.27$, $p = 0.006$, $\eta_p^2 = 0.035$), Tukey-corrected post-hoc analyses showed that single participants scored lower then those in a long-term relationship ($t(357) = 3.58$, $p = 0.002$) or married ($t(357) = 2.68$, $p = 0.039$). The other groups did not differ from each other significantly. In contrast, in females ($F(3, 435) = 8.10$, $p < 0.001$, $\eta_p^2 = 0.05$), single and short-term groups had a lower score than long-term ($t(435) = 3.03$, $p = 0.014$; $t(435) = 4.05$, $p < 0.01$, respectively) and married ($t(435) = 2.81$, $p = 0.027$; $t(435) = 3.89$, $p < 0.01$, respectively) groups. There were no other significant group differences. For the Ludus subscale, follow-up one-way ANOVAs revealed different patterns for the relationship status. The main effect was nonsignificant in males. In females ($F(3, 435) = 8.35$, $p < 0.001$, $\eta_p^2 = 0.054$), the Tukey-corrected post-hoc tests revealed that participants in the short-term group reached significantly higher scores than those in the single ($t(435) = 4.35$, $p < 0.001$), long-term ($t(435) = 4.65$, $p < 0.001$) and married ($t(435) = 4.88$, $p < 0.001$) groups. See Fig. 2 and Table 3 for descriptive statistics.

The relationship status had a significant main effect on the Eros subscale ($F(3, 796) = 8.85$, $p < 0.01$, $\eta p2 = 0.03$), the Ludus subscale ($F(3, 796) = 7.56$, $p < 0.01$, $\eta p2 = 0.03$), the Mania subscale ($F(3, 796) = 7.88$, $p < 0.01$, $\eta p2 = 0.03$) and the Agape subscale ($F(3, 796) = 3.24$, $p = 0.022$, $\eta p2 = 0.01$). The Tukey-corrected pairwise comparisons revealed that on the Eros subscale single respondents and people in short-term relationship did not differ but both scored lower than participants in a long-term relationship ($t(796) = 4.44$, $p < 0.01$; $t(796) = 3.74$, $p < 0.01$, respectively) and married ($t(796) = 3.11$, $p = 0.011$; $t(796) = 2.57$, $p = 0.05$, respectively) who did not differ. On the Ludus subscale participants in a short-term relationship scored higher than single ($t(796) = 4.01$, $p < 0.01$) long-term ($t(796) = 4.44$, $p < 0.01$) and married ($t(796) = 3.33$, $p < 0.01$) groups. The latter three groups did not differ from each other. On the Mania subscale married participants scored lower than participants in the single ($t(796) = 4.50$, $p < 0.01$) and long-term ($t(796) = 2.86$, $p = 0.022$) group. The other groups did not differ. Lastly, on the Agape subscale the short-term group scored lower than the long-term group ($t(796) = 3.00$, $p = 0.015$). The other groups did not differ. See Fig. 3 and Table 3 for descriptive data.

Fig. 2 *Relationship status (single, short-term, long-term, married) × gender (males, females) interaction effects on the Eros (bottom) and Ludus (top) subscales of the LAS-HSF. Raw scores are presented with 95% confidence intervals*

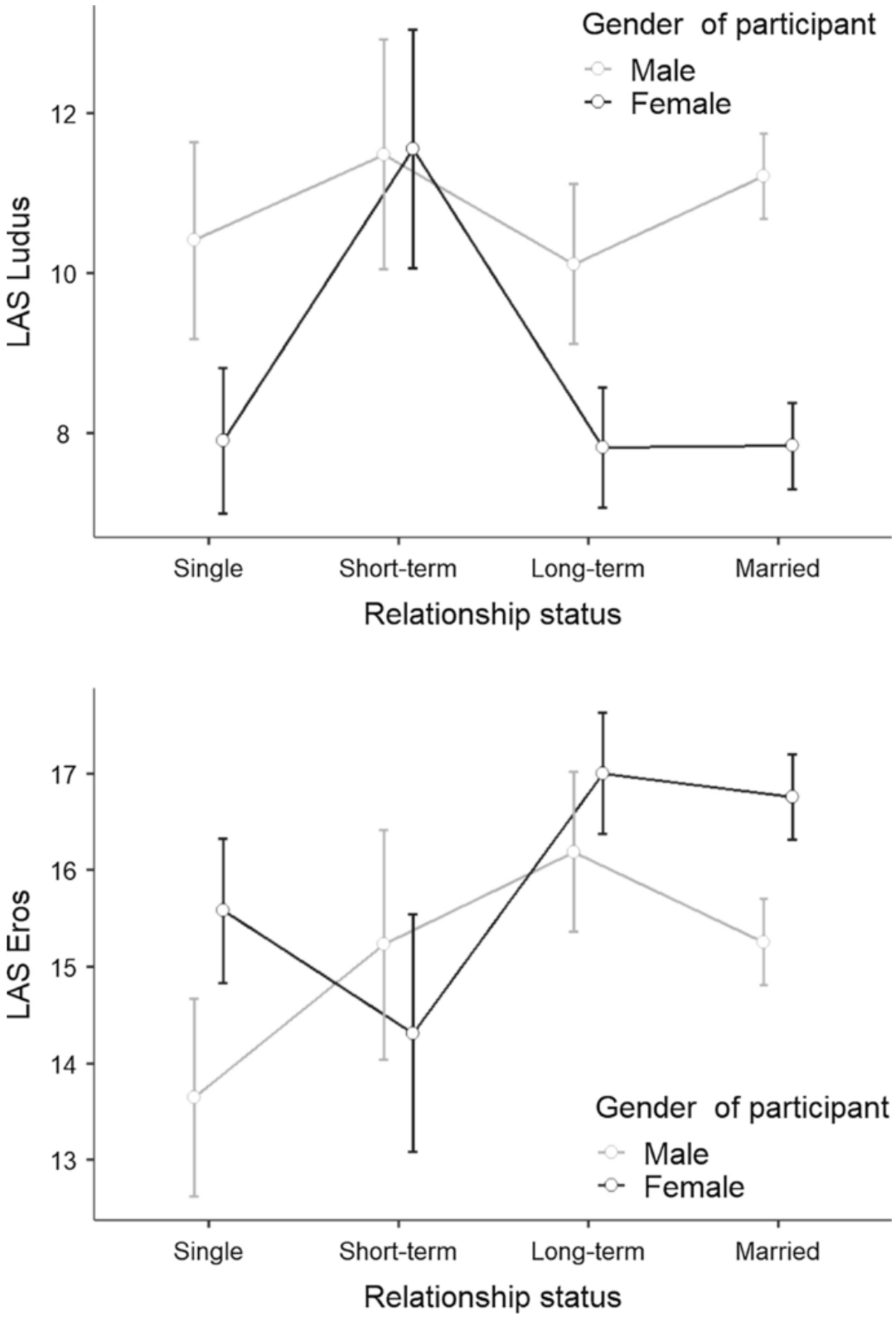
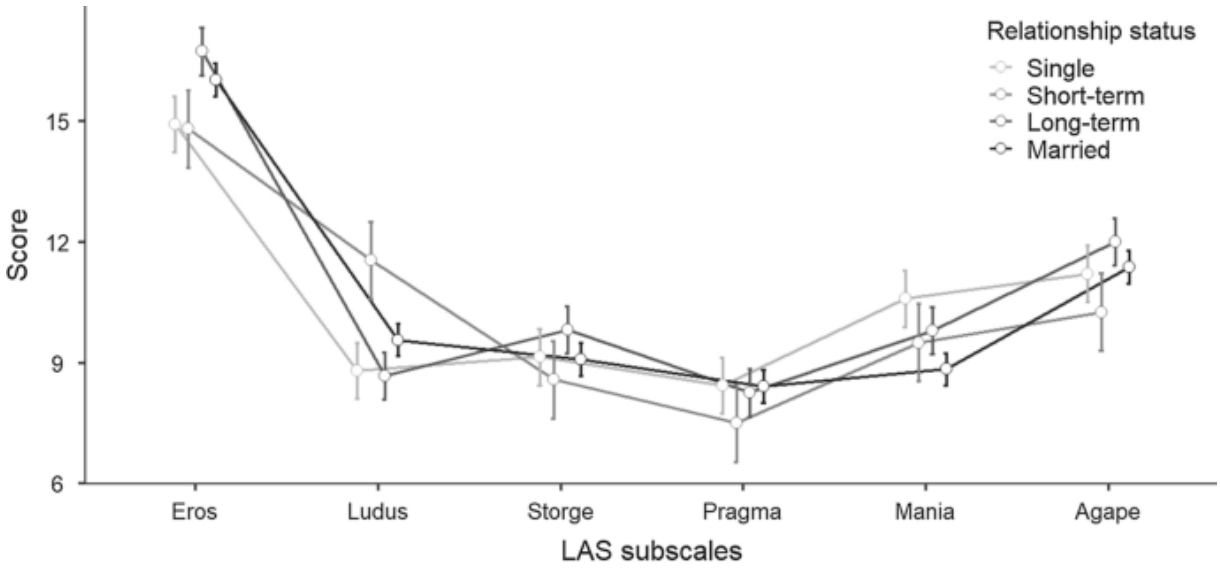


Table 3 *Mean scores and 95% confidence limits of the six subscales of the LAS-HSF broken down by gender and relationship status*

				95% Confidence Interval	
Gender	Relationship status	LAS-SF subscale	Mean	Lower	Upper
Male	Single	Eros	13.67	12.51	14.82
		Ludus	10.43	9.27	11.58
		Storage	9.19	8.03	10.35
		Pragma	7.78	6.63	8.94
		Mania	9.71	8.56	10.87
		Agape	12.00	10.84	13.16
	Short-term	Eros	15.25	13.91	16.59
		Ludus	11.51	10.17	12.85
		Storage	7.86	6.52	9.20
		Pragma	6.54	5.20	7.88
		Mania	8.51	7.17	9.85
		Agape	10.31	8.97	11.65
	Long-term	Eros	16.21	15.26	17.16
		Ludus	10.13	9.19	11.08
		Storage	9.48	8.53	10.42
		Pragma	7.55	6.61	8.50
		Mania	9.80	8.86	10.75
		Agape	12.38	11.44	13.33
	Married	Eros	15.28	14.74	15.81
		Ludus	11.24	10.70	11.77
		Storage	8.72	8.19	9.26
		Pragma	7.77	7.24	8.31
		Mania	8.71	8.17	9.24
		Agape	11.66	11.12	12.20
Female	Single	Eros	15.60	14.74	16.46
		Ludus	7.92	7.06	8.78
		Storage	9.10	8.24	9.96
		Pragma	8.78	7.92	9.64
		Mania	11.05	10.19	11.91
		Agape	10.78	9.92	11.64
	Short-term	Eros	14.33	12.95	15.72
		Ludus	11.57	10.19	12.96
		Storage	9.33	7.95	10.72
		Pragma	8.51	7.12	9.89
		Mania	10.54	9.15	11.93
		Agape	10.19	8.81	11.58

Long-term	Eros	17.02	16.29	17.75
	Ludus	7.84	7.11	8.56
	Storage	10.00	9.27	10.72
	Pragma	8.64	7.91	9.37
	Mania	9.79	9.06	10.52
	Agape	11.78	11.05	12.51
Married	Eros	16.78	16.24	17.32
	Ludus	7.85	7.31	8.39
	Storage	9.44	8.90	9.98
	Pragma	9.05	8.51	9.59
	Mania	8.96	8.42	9.50
	Agape	11.07	10.53	11.61

Fig. 3 *Relationship status (single, short-term, long-term, married) profiles on the six subscales of the LAS-HSF. Raw scores are presented with 95% confidence intervals*



Discussion

The presented results confirmed most predictions of the study, and several novel findings were obtained. The results of the CFA and the reliability analysis show that the LAS-HSF is a reliable measure, whose factor structure is identical with that of the original version (P1). The validity tests revealed a strong negative association between the Eros love style and unrestricted sociosexuality (i.e., the SOI-R scale and its Desire subscale). Furthermore, the Eros love style showed significant but uninterpretably low correlations (rho < 0.25) with mate value (MVS) and various sexual motives (YSEX?-HSF). The Ludus love style showed moderate correlations with the SOI-R and each of its subscales, and with self-focused and coping-oriented sexual

motives (personal goal attainment and sex as coping subscales of YSEX-HSF). Apart from these associations, only uninterpretably low correlations were obtained, except for Mania, which showed a relatively high positive correlation with the Sex as coping subscale of the YSEX?-HSF. Importantly, no association of an interpretable magnitude was obtained for mate value. This finding contradicts expectation based on a finding reported by Zeigler-Hill and colleagues (2015), who revealed a significant negative relationship between Mania love style and self-esteem. This could be due to the fact that the conceptual overlap between global self-esteem and self-perceived mate value can be moderated by mate choice strategies (mate value in short-term vs. long-term relationship contexts). In sum, the results show that the LAS-HSF is a valid instrument (P2), which provides useful measures for research on love and intimate partner relationships, similarly to the original version and its previously published adaptations.

As expected, preferences for various love styles showed significant differences across relationship statuses. This finding suggests that different types of relationships are typically associated with different types of love experience (see Fig. 3). In other words, relationship type has an impact on partners' feelings of love. This is in line with previous findings (e.g., Dush and Amato 2005; Heshmati et al. 2019; Richardson et al. 1988).

Men as compared to women scored significantly higher on the Ludus love style, while taking account of relationship status provided deeper insight into the connection between sex and love style preferences (see Fig. 2). The related findings show that a significant sex difference in the preference for Ludus may only be observed among singles and among those living in a committed relationship or in marriage, whereas women preferring short-term relationships endorse Ludus as much as their male counterparts. In other words, women pursuing short-term relationship-related goals employ a strategy similar to that followed by men oriented towards the short term (e.g., Buss and Schmitt 1993; Gangestad and Simpson 2000). In such cases, women also prefer game playing to other love styles.

The relative preference for the Eros love style in various relationship statuses showed different patterns among men versus women. Men with casual, committed and married status reported relatively high preference for Eros as compared to single men. Regarding women, by contrast, high Eros scores were only obtained for those living in a committed relationship as opposed to singles and those involved in casual relationships (see Fig. 2). These findings are in line with those obtained in several previous studies. For example, Marzec and Łukasik (2017) suggest that the amount of investment in a relationship is positively associated with commitment. Sex-related qualitative and quantitative differences in investment (e.g., Trivers 1972) are also reflected in men's and women's different love experiences (e.g., Hendrick et al. 1984).

The findings of the present study show that the type of one's love experience is not unrelated to the context of one's relationship and to one's sex. Love style is part of a complex mating strategy, which organizes and orients affective and cognitive functions underlying sexual activity and mate choice, and which in part depends on individual characteristics and on the opportunities of interpersonal contact provided by the social environment. The LAS-HSF questionnaire is presented in Supplement 1.

Limitations

While the present study has significant strengths, including the verification of the factor structure and validity of the LAS-HSF, certain limitations are also worth noting. The study failed to assess participants' sexual orientation, while individuals with different orientations may show essential differences in love experience (e.g., Rosenberger et al. 2014; Unrau and Morry 2019). This is a shortcoming that future studies on love, sexuality and intimate partner relationships should eliminate.

Although the present study laid particular emphasis on relationship status both in the underlying theoretical considerations and in the interpretation of the findings, only one item with four response alternatives was dedicated to the assessment of participants' relationship status. It would have been possible to assess the duration of, satisfaction with, and the quality of attachment and commitment in, participants' relationships, as these variables have been commonly assessed in related studies (e.g., Ahmetoglu et al. 2010; Cannas Aghedu et al. 2020). Future studies should include a more thorough and more complex assessment of participants' relationship status.

Importantly, the associations between love styles and relationship statuses may be influenced by several factors not examined in the present study. The obtained findings support Lee's original theory suggesting that the love experienced in different types of relationships may have diverse bases, since different types of relationships involve individuals with different personality structures, attachment styles, and sociosexual orientations, who follow different mate choice strategies (Lee 1973, 1988).

Finally, the mean differences obtained in the present study showed relatively low, albeit significant, effect sizes. Consequently, these findings have limited validity, and further studies are required in order to draw reliable general conclusions.

Notes

We also used the graded response model (GRM) (Samejima 1968) to examine the psychometric properties of each item. The GRM allows items to relate differentially to a latent trait, thus the GRM estimates item discrimination (a) and difficulty (b) parameters. The a parameter shows the scale slope at a given item location, i.e. b parameter, where the discrimination occurs. The steeper a slope is the better discrimination property an item has (Baker 2001). The discrimination power of an item is moderate if the a parameter is between the values .65 and 1.34, high if the value falls between 1.35 and 1.69 and can be considered very high is it is above 1.70 (Baker 2001). The estimated category difficulty, i.e. b parameter, represent a point at which a person with ability equal to a given difficulty has a 50% chance of responding in a category equal to or higher than the difficulty designates. The analysis showed that all items had at least moderate discrimination power (the majority had high or very high). See Supplementary Table 1 for the coefficients, standard errors and 95% confidence intervals.

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Ethics declarations

Conflict of interest Author Norbert Meskó declares that he has no conflict of interest. Author András N. Zsidó declares that he has no conflict of interest. Author András Láng declares that he has no conflict of interest. Author Kázmér Karádi declares that he has no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

Supplementary Materials

Supplement 1 *The Hungarian version of Love Attitude Scale Short Form*

Szerelmi attitűd kérdőív (LAS-HSF)

Az alábbiakban felsorolunk néhány olyan állítást, amelyek a szerelemre vonatkozó különböző attitűdöket tükrözik. Minden állítás mellett töltse ki a válaszlapot, amely jelzi, hogy mennyire ért egyet az adott állítással. Az állítások egy adott szerelmi kapcsolatra vonatkoznak. Ha lehetséges, válaszoljon a kérdésekre aktuális partnerére gondolva. Ha jelenleg nincs partnere, válaszoljon legutóbbi partnerére gondolva. Ha még soha nem volt szerelmes, akkor válaszoljon úgy, hogy a legvalószínűbben mit válaszolna, ha szerelmes lenne.

1	2	3	4	5
Egyáltalán nem értek egyet az állítással	Mérsékelten nem értek egyet az állítással.	Semleges – egyformán egyetértek, és nem is értek egyet	Mérsékelten egyetértek az állítással	Teljes mértékben egyet értek az állítással

..... 1. A partnerem és közöttem megfelelő a testi “kémia”.
..... 2. Úgy érzem, hogy a partnerem és én egymásnak lettünk szánva.
..... 3. A partnerem és én valóban megértjük egymást.
..... 4. A partnerem megfelel az én ideális fizikai szépség/jóképűség elvárásaimnak.
..... 5. Úgy vélem, hogy amit a partnerem nem tud rólam, az nem is fáj neki.
..... 6. Néha távol kellett tartanom a partneremet, nehogy rájöjjön, hogy más szeretőim is vannak.
..... 7. A partnerem zaklatott lenne, ha tudna néhány dologról, amit más emberekkel tettem.
..... 8. Szeretem a “szerelem játékát” játszani a partneremmel és számos más partnerrel.
..... 9. A szerelmünk a legjobb fajta, mert egy hosszú barátságból alakult ki.
..... 10. Barátságunk idővel fokozatosan alakult át szerelemmé.
..... 11. A szerelmünk valójában egy mély barátság, nem egy titokzatos, misztikus érzelem.
..... 12. Szerelmi kapcsoltunk azért nagyon kielégítő, mert egy jó barátságból fejlődött ki.
..... 13. A partnerem kiválasztásakor az egyik fő szempont az volt, hogy mit gondol a családomról.
..... 14. A partnerem kiválasztásakor fontos tényező volt, hogy vajon jó szülő lenne-e.

..... 15. A partnerem kiválasztásakor az egyik megfontolás az volt, hogy mit gondol a karrieremről.

..... 16. Mielőtt nagyon közel kerültünk volna egymáshoz a partneremmel, megpróbáltam kitalálni, hogy mennyire passzolnak egymáshoz a génjeink arra az esetre, ha valaha is gyerekeink lennének.

..... 17. Ha a partnerem nem figyel rám, teljesen belebetegszem.

..... 18. Mióta szerelmes lettem a partnerembe, nehezen koncentrálok bármi másra.

..... 19. Nem tudom elengedni magam, ha azt gyanítom, hogy a partnerem valaki mással van.

..... 20. Ha a partnerem egy darabig figyelmen kívül hagy, néha hülyeségeket csinálok, hogy visszaszerezzen a figyelmét.

..... 21. Inkább én magam szenvednék, minthogy hagyjam a partneremet szenvedni.

..... 22. Nem tudok boldog lenni anélkül, hogy a partnerem boldogságát a sajátom elé ne helyezném.

..... 23. Általában hajlandó vagyok feláldozni a saját vágyaimat, hogy a partnerem elérhesse az övéit.

..... 24. A partnerem kedvéért mindent elviselnék.

Kiértékelési útmutató:

Eros: 1-4

Ludus: 5-8

Storge: 9-12

Pragma: 13-16

Mania: 17-20

Agape: 21-24

Supplementary Table 1

(See original Supplementary Table 1 file on the publisher's website at https://static-content.springer.com/esm/art%3A10.1007%2Fs12119-021-09830-z/MediaObjects/12119_2021_9830_MOESM2_ESM.xlsx)

					95% CI							95% CI	
Scale	Item nr.	Parameter	Coefficient	SE	lower	upper	Scale	Item nr.	Parameter	Coefficient	SE	lower	upper
Eros	1	a	1.83	.14	1.55	2.10	Eros	5	a	1.39	.11	1.16	1.61
		b							b				
		>=2	-2.47	.15					>=2	-1.10	.09		
		>=3	-1.73	.11					>=3	-.26	.07		
		>=4	-1.03	.07					>=4	.40	.07		
		=5	.08	.05					=5	1.20	.10		
	2	a	3.85	.41	3.03	4.67		6	a	3.46	.42	2.62	4.29
		b							b				
		>=2	-1.90	.09					>=2	.69	.05		
		>=3	-1.17	.06					>=3	.95	.06		
		>=4	-.41	.04					>=4	1.28	.07		
		=5	.49	.05					=5	1.70	.09		
	3	a	2.43	.18	2.07	2.79		7	a	2.56	.24	2.08	3.04
		b							b				
		>=2	-2.33	.13					>=2	-.44	.05		
		>=3	-1.48	.08					>=3	.12	.05		
		>=4	-.72	.06					>=4	.51	.05		
		=5	.41	.05					=5	.97	.07		
	4	a	1.41	.11	1.19	1.64		8	a	1.78	.14	1.49	2.07
		b							b				
		>=2	-3.13	.24					>=2	.06	.06		
		>=3	-2.17	.15					>=3	.62	.06		
		>=4	-1.04	.09					>=4	1.08	.08		
		=5	.38	.07					=5	1.92	.12		

Scale	Item nr.	Para-meter	Coeff-icient	SE	95% CI lower	95% CI upper	Scale	Item nr.	Para-meter	Coeff-icient	SE	95% CI lower	95% CI upper
Eros	9	a	5.09	.42	4.27	5.92	Eros	13	a	1.80	.21	1.38	2.23
		b							b				
		>=2	-.05	.04					>=2	.59	.06		
		>=3	.40	.04					>=3	1.31	.10		
		>=4	.87	.04					>=4	2.02	.16		
		=5	1.31	.06					=5	3.24	.29		
	10	a	5.39	.46	4.48	6.31		14	a	1.74	.20	1.35	2.13
		b							b				
		>=2	.07	.03					>=2	-.61	.07		
		>=3	.51	.04					>=3	-.14	.06		
		>=4	.91	.05					>=4	.43	.06		
		=5	1.30	.06					=5	1.43	.11		
	11	a	1.18	.09	.98	1.37		15	a	1.53	.16	1.21	1.85
		b							b				
		>=2	-.96	.10					>=2	-.12	.06		
		>=3	-.05	.07					>=3	.56	.07		
		>=4	.91	.09					>=4	1.45	.12		
		=5	2.02	.16					=5	2.78	.23		
	12	a	5.64	.51	4.64	6.65		16	a	1.04	.12	.79	1.29
		b							b				
		>=2	-.01	.03					>=2	.52	.09		
		>=3	.50	.04					>=3	1.29	.14		
		>=4	.92	.05					>=4	2.09	.21		
		=5	1.44	.07					=5	3.06	.32		

Scale	Item nr.	Para-meter	Coeff-icient	SE	95% CI lower	95% CI upper	Scale	Item nr.	Para-meter	Coeff-icient	SE	95% CI lower	95% CI upper
Eros	17	a	2.49	.23	2.04	2.95	Eros	21	a	1.83	.12	1.58	2.08
		b							b				
		>=2	-.81	.06					>=2	-1.66	.10		
		>=3	.00	.05					>=3	-.88	.07		
		>=4	.81	.06					>=4	.24	.05		
		=5	1.85	.11					=5	1.27	.08		
	18	a	1.54	.12	1.29	1.79		22	a	2.92	.22	2.47	3.36
		b							b				
		>=2	-.42	.07					>=2	-1.11	.06		
		>=3	.57	.07					>=3	-.38	.05		
		>=4	1.51	.11					>=4	.51	.05		
		=5	2.27	.16					=5	1.51	.08		
	19	a	1.22	.10	1.01	1.43		23	a	2.76	.20	2.36	3.17
		b							b				
		>=2	-.67	.08					>=2	-1.40	.08		
		>=3	.08	.07					>=3	-.57	.05		
		>=4	.81	.09					>=4	.45	.05		
		=5	1.67	.14					=5	1.48	.08		
	20	a	2.10	.18	1.73	2.47		24	a	1.99	.14	1.70	2.29
		b							b				
		>=2	-.03	.05					>=2	-.37	.06		
		>=3	.74	.06					>=3	.31	.05		
		>=4	1.32	.08					>=4	1.22	.08		
		=5	2.34	.15					=5	2.32	.14		

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2.5 Sex Differences in Predictors of Relationship Satisfaction: The Effects of Dyadic Coping, Love, Sexual Motivation and Having Children[5]

Norbert Meskó[1*], Fanni Őry[1], Zsuzsa Happ[1], András Norbert Zsidó[1]

[1] Institute of Psychology, University of Pécs, Pécs, Hungary

Abstract

The present study explored sex differences in the predictors of relationship satisfaction (dyadic coping, love, sexual motivation, having children). A total of 465 Hungarian participants (319 women and 146 men) with a mean age of 33.6 years completed an online test battery comprising four self-report measures. The results revealed that women's relationship satisfaction had more significant predictors than men's, and half of the common predictors showed significant sex differences. Men's satisfaction was positively predicted by the Intimacy and Passion components of love, while it was negatively predicted by Negative Dyadic Coping and by having at least one child. Besides Intimacy and Passion, two common predictors across sexes, women's satisfaction was also positively predicted by the Commitment component of love, and also by successful coping with dyadic stress. By contrast, negative predictors were having sex as a means of coping with emotional problems (Sex as Coping), the individual aspect of dyadic coping (One's Own Dyadic Coping), and Negative Dyadic coping. The findings are discussed in both bio-psychological and social constructionist approaches.

Keywords: relationship satisfaction, dyadic coping, love, sexual motivation, sex differences.

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Theoretical Background

Relationship Satisfaction, Children, Sex Differences

Marital relationship satisfaction became a central subject of psychological research following the publication of a research report authored by Terman and colleagues (1938). Certain aspects of intimate partner relationships such as communication, commitment, love, and intimacy potentially influence partners' perceptions of the quality of their relationship (Diener & Lucas, 2000). Those partners who are satisfied with their romantic relationship report positive experiences in other domains of their lives (Molero et al., 2017).

At the same time, several studies found a negative association between relationship satisfaction and the number of children (for a review, see Kowal et al., 2021). The researchers point out various factors possibly underlying this observation such as a conflict between parental and marital roles, a sense of restricted personal autonomy, unsatisfactory sex life compared to previous experiences, and increased financial burdens associated with parenting. The relationship between parenting and marital relationship satisfaction is not unequivocal, however (e.g., Dillon & Beechler, 2010; Onyishi et al., 2012). Nelson and colleagues (2013) found that partners who had children reported higher levels of happiness and satisfaction with life and more positive emotional experiences compared to childless couples. By contrast, Dobrowolska and colleagues (2020) revealed no relationship between the number of children and relationship satisfaction in a cross-cultural study involving 33 countries with predominantly individualistic versus collectivistic values.

Relationship satisfaction shows predictable sex differences. There are certain studies revealed that male participants were more satisfied with their marriage than their female counterparts (Bernard, 1982; Rostami et al., 2014). This observation was subsequently corroborated in both Western (e.g., Fowers, 1991; Jackson et al., 2014) and non-Western societies (e.g., Al-Darmaki et al., 2016). This sex-related asymmetry may be due to biological differences as well as cultural factors such as gender roles, patriarchal values, or social inequalities (e.g., Taniguchi & Kaufman, 2014). Recently, a study involving participants from 33 countries confirmed the marked sex difference in relationship satisfaction (Dobrowolska et al., 2020). The consistency of the observation sharply raises the question why men report higher satisfaction than women. Despite the existing cultural differences in intimate partner relationships, it is generally true that women are primarily responsible for household chores. These burdens in turn probably affect women's quality of life and relationship experiences (Grote & Clark, 2001). This is a plausible explanation particularly because women who share the chores with their partners and

those responsible for tasks associated with higher social status report higher satisfaction than other women (e.g., Fankhauser et al., 2018).

By contrast, biological/evolutionary explanations focus on sex differences in human reproductive biology (Eagly & Wood, 1999; Naftolin, 1981), which are manifested in differences in mating preferences (Buss & Schmitt, 2019; Walter et al., 2020, 2021), parental investment (Trivers, 1972), sexual drive (Lippa, 2009), intimate relationships (Palchykov et al., 2012; Pearce et al., 2019) and generally in reproduction-related behavioral and psychological factors (Conroy-Beam et al., 2019). In this approach, sex differences in partner relationship functioning are closely associated with those in mating strategies.

Dyadic Stress and Dyadic Coping

Bodenmann (1997) defines dyadic stress as a result of an event involving both partners either directly (the stressor has a direct impact on each partner) or indirectly (one partner is directly involved with the stressor, which has an impact on the other partner and on their relationship due to their closeness). Couples encounter various stressors during their everyday life, which influence family communication and relationship satisfaction (Bodenmann et al., 2006; Bodenmann et al., 2017). When facing dyadic stressors, mutually committed partners mobilize their shared psychological resources to cope with threat. Successful coping requires both partners to adequately communicate and understand their own and each other's feelings and mental states.

Dyadic coping is aimed at restoring relationship satisfaction and maintaining a functional dyad. Dysfunctional dyadic coping (characterized by maladaptive cognitive and behavioral strategies) usually generates severe anxiety in family members, and it may in extreme cases result in divorce or separation and dissolution of the family (Tesser & Beach, 1998).

Dyadic coping has both positive and negative forms, the former including common, supportive, and delegated coping, while the latter comprised hostile, ambivalent, and superficial coping. Research found a positive association between the overall quality of dyadic coping and relationship satisfaction, that is, those partners who reported more positive dyadic coping were more satisfied with their relationships than others (Bodenmann, 1997; Bodenmann et al., 2017). Furthermore, the quality of dyadic coping is one of the most important predictors of separation. Several studies revealed a negative association between negative dyadic coping and relationship satisfaction (e.g., Falconier & Kuhn, 2019; Hilpert et al., 2016). Successful dyadic coping associates positively also with life satisfaction (Gabriel et al., 2016).

Martos and colleagues (2012, 2016, 2021) found that relationship satisfaction was positively associated with each positive form of dyadic coping and negatively associated with

negative forms. The authors also found a marked sex difference in dyadic coping: both female and male participants rated stress communication as more characteristic to women than to men. Furthermore, women's relationship satisfaction was significantly associated with more factors than men's. Factors such as stress communication, the partner's supportive, delegated and negative coping, and common coping and its perceived quality were associated with women's but not men's relationship satisfaction.

Triangular Theory of Love

Sternberg (1986, 1997) describes love by the relative importance of three components including intimacy, passion and commitment. Intimacy is the experience of closeness, connectedness and attachment in a love relationship (Mikulincer & Shaver, 2019). Intimacy enables partners to extend their selves to the dyad, to reach emotional, cognitive or spiritual self-transcendence (Aron & Tomlinson, 2019). In terms of emotionality, intimacy is the warmth experienced in a love relationship. Passion is a sensually intense state of mind, which provides the primary drive for romantic love. In this state of intense excitement, two individuals experience irresistible attraction towards each other (Feybesse & Hatfield, 2019). Passion is often experienced as physical attraction or sexual gratification (Hatfield & Rapson, 2006; Sorokowski et al., 2021). In intimate partner relationships, passion is predominantly manifested in a desire for sexual union. Commitment means the choice of a specific partner in the short term and sustaining the relationship in the long term (Sternberg, 1986). Partner choice and commitment do not necessarily take place simultaneously. For example, one may decide to love someone without committing oneself to the partner at the same time, and vice versa, one may commit oneself to someone without experiencing love (Sorokowski et al., 2021). Commitment provides a basis for an intimate partner relationship even when the partners are facing difficulties and question whether their relationship is worth continuing. Empirical findings on satisfying relationships suggest that commitment may increase over time (Cassepp-Borges, 2021).

Studies assessing the three components of love with self-report measures revealed mixed findings on sex differences. Fernández-Carrasco and colleagues (2019) obtained significantly higher intimacy and commitment scores for women than for men at the beginning of the pregnancy and at the third trimester. Debrot and collegaues (2021) investigated Black undergraduate South African students self-reported notions of love. They found significant differences between sexes: females were somewhat to significantly above average as compared to males on all three components of love. In a study conducted more than twenty years ago, the authors found significantly higher intimacy scores for men in a sample of 213 married participants (Lemieux & Hale, 2000). These studies confirm the theoretical expectation that all three love

components are significant predictors of relationship satisfaction. The picture of the hypothetical sex differences appears even more complicated when considering the findings of a large-sample study involving 7332 participants from 25 countries, which found no sex difference on any of the three love components (Sorokowski et al., 2021). A correlation between relationship satisfaction and the Sternberg Triangular Love Scale has been found in several recent studies (Andrade et al., 2015; Cassepp-Borges, 2021; Kochar & Sharma, 2015). One important outcome of this research is that love (commitment, passion and intimacy) is a reliable predictor of relationship satisfaction.

Sexual Motivation

One's specific motives for engaging in sexual activity have important implications both for one's relationship with the partner and for one's mental health (e.g., Hatfield et al., 2010). In the context of romantic relationships, the frequency of sexual activity and the level of the partners' satisfaction with their sex life are important indicators of the general quality of their relationship (Fallis et al., 2016). The close association observed between the quality of sex life and relationship satisfaction suggests that rewarding sex offers a means of improving relationship quality. The ability to maintain an intimate sexual relationship in the long term is likely to reinforce couple satisfaction (Rehman et al., 2011; Yoo et al., 2014). However, Schoenfeld and colleagues (2017) point out that there are couples generally satisfied with their relationship but not with their sex life, and vice versa. That is, the degree of interdependence between sexual and relationship satisfaction probably shows considerable variation across couples (Dewitte & Mayer, 2018).

Previous studies on sexual motivation revealed characteristic sex differences. Klusmann (2002) revealed that while both women's and men's sexual activity and satisfaction decreased with time, sexual desire decreased in women but not in men. Furthermore, the motivation for sexual intimacy increased in women, while it decreased in men. Findings reported by Meston and Buss (2007) suggest that men are more motivated for unemotional sex than women are.

Using the same methodology as that employed by Meston and Buss (2007), Meskó and colleagues (2022)conducted three studies with a Hungarian sample, whose results corroborated previous findings on the universal diversity of sexual motivation. In addition to similarities and differences between the American and Hungarian samples in the composition and relative importance of sexual motives, Meskó and colleagues (2022)found that various reasons for having sex had important links with age, sex, personality, and mating strategy. These findings are in line with previously revealed associations between individual differences in sexual motivation

and age- and sex-related variations in biological and psychological factors of reproductive behavior (e.g., Kennair et al., 2015; Meston & Buss, 2007).

Research Aim

In line with previous findings on the sex-related psychological characteristics of intimate partner relationships, marked sex differences were expected in relationship satisfaction (e.g., Dillon, 2012; Dillon et al., 2015; Sorokowski et al., 2017), dyadic coping (e.g., Bodenmann et al., 2017; Hilpert et al. 2016), love components (e.g., Sorokowski et al., 2017), and sexual motivation (e.g., Kennair et al., 2015; Meskó et al., 2022). Furthermore, the present study explored the possible impact of having children on relationship satisfaction in a Hungarian sample, since the related previous findings for Western couples are marked by inconsistencies (e.g., Dobrowolska et al., 2020; Nelson et al., 2013). More specifically, the various components of dyadic coping (i.e., one's own dyadic coping, partner's dyadic coping, negative dyadic coping, positive dyadic coping) the three love components (intimacy, passion, commitment) the major types of sexual motives (personal goal attainment, relational motives, sex as coping) and having children were expected to have sex-dependent effects on relationship satisfaction. Since this part of the study fulfilled exploratory objectives, no specific predictions were made.

Method

Sample and Procedure

A total of 465 Hungarian adults participated in the study, including 319 women (68.6%) and 146 men (31.4%), who were aged 18 to 72 years (M = 30.4, SD = 10.9). On average, the female participants were significantly younger (aged 18 to 64 years, M = 28.9, SD = 9.5) than the male participants (aged 18 to 72 years, M = 33.6, SD = 12.9, $t(463) = 4.40$, $p < .001$). Of all participants, 63.0% completed tertiary education, 35.3% completed secondary education, and 1.7% completed primary education. As many as 94% reported to be currently involved in a stable intimate partner relationship. Of these participants, 161 (35%) were dating their partners, 152 (33%) cohabited with their partners, and 120 (26%) were married. 6% reported that they are currently single, have casual sexual relationships or it is difficult to define what type of relationship they are in. The further analysis includes all participants, regardless of the fact that some were not in a committed relationship at the time of the study. Of all participants, 456 (98%) reported to have previously engaged in sexual intercourse, while only 126 (27%) had had one or more children at the time of data collection.

The participants were recruited via social media (e.g., Facebook), and they completed an online form containing four self-report measures. Each participant gave informed consent at the

top of the form, while they provided demographic data at the end, including sex, age, level of education, previous sexual experience, current relationship status, and number of children. The study received ethical approval as part of a larger research project on mating strategies from the Hungarian United Ethical Review Committee for Research in Psychology (Ref. No. 2018/115).

Statistical Data Analysis

We used linear regression modelling (enter method) to explore which of the measured factors determine participants' perceived relationship satisfaction. In the model, the combined score of the relationship satisfaction (RAS-H) served as the dependent variable, while love (subscales of STLS-H), sexual motivation (subscales of YSEX?-HSF), dyadic coping (four subscales of DCI), and whether the participant had any children were the independent variables. We tested this model separately for males and females and then used Fisher r-to-z transformation to compare the differences in the predictors across sexes. The Durbin-Watson tests of autocorrelation were nonsignificant (DW = 2.28, p = .13 for males and DW = 1.89, p = .33 for females) and VIF values were smaller than 10.

Measures

Relationship Satisfaction

Relationship Assessment Scale (RAS; Hendrick, 1988; adapted to Hungarian by Martos et al., 2014). The Hungarian version of the RAS (RAS-H) is an eight-item Likert-type scale that provides a measure of overall relationship satisfaction. The RAS-H contains one item not included in the seven-item original version (How satisfactory do you find your sexual relationship?). The participants rated each item on a five-point scale ranging from 1 indicating extreme dissatisfaction (e.g., Not at all satisfied) to 5 indicating extreme satisfaction (e.g., Very satisfied). In the present study, the RAS-H showed adequate internal consistency (Cronbach's α = .90).

Dyadic Coping

The 37-item Dyadic Coping Inventory (DCI, Bodenmann, 2008; adapted to Hungarian by Martos et al., 2012) that measures several forms of one's own dyadic coping (i.e., what the respondent does when her/his partner is stressed) and of one's partner's perceived dyadic coping (i.e., what the respondent thinks her/his partner does when the respondent is stressed). The participants rated each Likert item on a five-point scale ranging from Very rarely (1) to Very often (5). In the present study, the following four aggregated dyadic coping subscales were used. One's Own Dyadic Coping (DCO) comprises one's own behavioral responses to stressful dyadic situations (e.g., I show my partner through my behavior when I am not doing well or when I have problems). Partner's Dyadic Coping (DCP) includes one's partner's perceived

behaviors in stressful situations such as engaging in a joint response to the stressor or taking over a burdensome task or activity from the partner (e.g., My partner tells me openly how he/she feels and that he/she would appreciate my support). Negative Dyadic Coping (NDC) is any supportive endeavor that involves hostile, ambivalent or stereotypical behavior such as simultaneously supporting and criticizing the partner (e.g., I provide support but do it so unwillingly and unmotivated because I think that he/she should cope with his/her problems on his/her own). Positive Dyadic Coping (PDC) includes various emotion- and problem-oriented responses specifically aimed at supporting the partner's coping capacity such as empathic understanding or joint problem analysis (e.g., I try to analyze the situation together with my partner in an objective manner and help him/her to understand and change the problem). All four subscales showed adequate internal consistency (Cronbach's α = .80, .88, .79, and .91, respectively).

Love

Sternberg Triangular Love Scale (STLS; 1986, 1997; adapted to Hungarian by Sorokowski et al., 2021). The STLS consists of 45 items, 15 of which measure the three love components each, including intimacy (e.g., I receive considerable emotional support from ___), passion (e.g., There is nothing more important to me than my relationship with ___), and commitment (e.g., I view my relationship with ___ as permanent). The participants rated each Likert item on a nine-point scale ranging from Strongly disagree (1) to Strongly agree (9). All three subscales showed adequate internal consistency (Cronbach's α = .95, .96, and .97, respectively).

Sexual Motivation

Reasons for Having Sex Questionnaire, Hungarian Short Form (YSEX?-HSF; Meskó et al., 2022). The YSEX?-HSF is a self-report instrument that consists of three summary scales assessing three major types of sexual motives including Personal Goal Attainment (e.g., *I wanted a new experience*; *It was a seduction / I was seduced*), Relational Reasons (e.g., *I was in love*; *I wanted to spiritually merge with the other person*), and Sex as Coping (e.g., *I wanted to decrease sadness*; *I wanted to save the relationship*). Each item is rated on a 5-point scale offering the following options: 1 = *None of my sexual experiences*; 2 = *Few* (…); 3 = *Some* (…); 4 = *Many*(…); 5 = *All of my sexual experiences*. Thus, higher scores reflect higher levels on each measure of sexual motives. All three subscales showed adequate internal consistency (Cronbach's α = .90, .92, and .89, respectively).

Results

In males, the linear regression model ($F(11, 114) = 24.1$, $p < .001$, $Ra^2 = .671$) showed that the factors that positively predicted relationship satisfaction scores were STLS Intimacy (β

= .40, 95% CI [.21, .59], $p < .001$) and STLS Passion (β = .28, 95% CI [.09, .47], $p = .005$). While the factors that negatively predicted the score were DCI Negative Dyadic Coping (β = -.18, 95% CI [-.35, -.02], $p = .033$) and having at least one child (β = -.24, 95% CI [-.46, -.02], $p = .031$). See Table 1 for the exact values.

In females, the linear regression model ($F(11,293) = 60.0$, $p < .001$, $Ra^2 = .681$) showed that the factors that positively predicted relationship satisfaction scores were STLS Intimacy (β = .15, 95% CI [.01, .28], $p = .034$), STLS Passion (β = .19, 95% CI [.06, .31], $p = .003$), STLS Commitment (β = .27, 95% CI [.15, .39], $p < .001$), and DCI Positive Dyadic Coping (β = .32, 95% CI [.15, .49], $p < .001$). In contrast, the factors that negatively predicted the score were YSEX?-HSF Sex as Coping (β = -.11, 95% CI [-.19, -.03], $p = .010$), DCI One's Own Dyadic Coping (β = -.15, 95% CI [-.27, -.03], $p = .012$), and DCI Negative Dyadic Coping (β = -.12, 95% CI [-.23, -.01], $p = .034$). See Table 1 for the exact values.

The comparison between males and females revealed that on the one hand STLS Intimacy was more positively associated to RAS in males ($z = 2.57$, $p = .005$), while having at least one child was a stronger negative predictor of RAS in males ($z = 1.76$, $p = .039$). On the other hand, STLS Commitment ($z = 1.69$, $p = .045$) and DCI Positive Dyadic Coping ($z = 2.09$, $p = .018$) were more positively associated to RAS in females, while YSEX?-HSF Sex as Coping was a stronger negative predictor of RAS in females ($z = 1.74$, $p = .041$).

Discussion

The present study explored sex differences on a set of psychological factors potentially predicting intimate partners' relationship satisfaction, including the four types of dyadic coping (one's own dyadic coping, partner's dyadic coping, negative dyadic coping, positive dyadic coping), the three love components (intimacy, passion, commitment), the three major types of sexual motives (personal goal attainment, relational motives, sex as coping), and having children. The obtained findings revealed that more factors had an effect on women's relationship satisfaction than on men's (7 vs. 4, respectively), and nearly half of the assessed predictors (5 out of 11) showed significant sex differences. These findings are discussed in detail below.

Table 1 *Regression Analyses for the Combined Score of RAS-H With STLS, YSEX?-HSF, and DCI Subscales, and Whether the Participant had Children as the Independent Variables*

	Males						**Females**							
					95% CI						**95% CI**		**Sex differences**	
Predictor	**B**	***t***	***p***	**β**	***LL***	***UL***	**B**	***t***	***p***	**β**	***LL***	***UL***	***z***	***p***
SLTS I	0.134	4.111	< .001	0.398	0.206	0.590	0.049	2.131	.034	0.146	0.011	0.281	2.57	< .001
SLTS P	0.066	2.851	.005	0.279	0.085	0.473	0.043	3.000	.003	0.186	0.064	0.308	0.93	.176
SLTS C	0.023	1.002	.318	0.095	-0.093	0.285	0.077	4.564	< .001	0.270	0.153	0.387	1.69	.045
YSEX?-HSF PGA	-0.049	-1.620	.108	-0.119	-0.264	0.026	0.006	0.335	.738	0.013	-0.064	0.091	1.24	.107
SYEX?-HSF RR	-0.003	-0.158	.875	-0.009	-0.132	0.113	0.014	1.161	.247	0.047	-0.032	0.127	0.53	.298
YSEX?-HSF SaC	0.037	1.113	.268	0.077	-0.060	0.216	-0.059	-2.576	.010	-0.107	-0.189	-0.025	1.74	.040
DCI DCO	-0.063	-0.926	.357	-0.086	-0.272	0.098	-0.118	-2.531	.012	-0.149	-0.264	-0.033	0.59	.277
DCI DCP	-0.058	-0.684	.495	-0.094	-0.369	0.179	0.024	0.560	.576	0.042	-0.106	0.192	1.29	.098
DCI NDC	-0.220	-2.155	.033	-0.182	-0.349	-0.014	-0.137	-2.131	.034	-0.118	-0.227	-0.009	-0.61	.270
DCI PDC	0.048	0.640	.524	0.103	-0.217	0.424	0.149	3.643	< .001	0.315	0.145	0.486	2.09	.018
Have children: Yes[a] – No	-1.419	-2.180	.031	-0.240	-0.458	-0.021	-0.339	-0.694	.488	-0.056	-0.215	0.103	1.76	.039

Note. The table shows the point estimates (B), standardized estimates (β), 95% confidence intervals (95% CI) for the standardized estimates. Sex differences were tested between the standardized estimates using Fisher *r*-to-*z* comparisons, statistical results are displayed in the rightmost columns of the table. STLS I = Sternberg Love Triangular Scale Intimacy; STLS P = Sternberg Love Triangular Scale Passion; STLS C = Sternberg Love Triangular Scale Commitment; YSEX?-HSF PGA = Reasons for Having Sex Questionnaire, Hungarian Short Form Personal Goal Attainment; YSEX?-HSF RR = Reasons for Having Sex Questionnaire, Hungarian Short Form Relational Reasons; YSEX?-HSF SaC = Reasons for Having Sex Questionnaire, Hungarian Short Form Sex as Coping; DCI DCO = One's Own Dyadic Coping; DCI DCP = Partner's Dyadic Coping; DCI NDC = Negative Dyadic Coping; DCI PDC = Positive Dyadic Coping.

[a]Reference level.

In males, high levels of intimacy and passion predicted high relationship satisfaction, while negative dyadic coping (including hostile, ambivalent and superficial coping responses) and having at least one child were associated with low satisfaction. These results are consistent with the related previous findings reported in the literature (e.g., Falconier & Kuhn, 2019; Martos et al., 2021).

As compared to males', females' relationship satisfaction showed a more complex psychological background as reflected in a larger number of both positive and negative predictors. High satisfaction was explained by high levels of intimacy, passion and commitment, and by high positive dyadic coping (i.e., the partners' mutual and/or joint efforts to deal with the stressor), while low satisfaction was predicted by the high perceived importance of using sex as coping, of the female partner's own dyadic coping (i.e., expressing her feelings to the partner in stressful dyadic situations), and of negative dyadic coping. Some of these results are in line with the related previous findings on sex differences in dyadic coping (e.g., Hilpert et al. 2016; Rusu et. al., 2016), sexual motivation (Meskó et al., 2022; Meston et al., 2020). Sex differences in relationship functioning are likely to be part of a broader human mating strategy that also organizes social cognition (Pearce et al., 2021), intimate relationships (Pearce et al., 2019) and mating preferences (Walter et al., 2020; 2021).

The negative association between the female participants' relationship satisfaction and their own dyadic coping is a seemingly contradictory finding, therefore it deserves particular attention. The most plausible explanation for this finding is that the female participants perceived their individual contribution to dyadic well-being to be disproportionately high. This explanation is consistent with a previous finding obtained for Hungarian males, which revealed that their satisfaction was positively associated with the self-perceived importance of their own dyadic coping (Martos et al., 2016, 2021). Hungarian couples tend to conform to traditional gender roles (e.g., Lomazzi et al., 2019; Shnabel et al., 2016; Sorokowski et al., 2021; Steiber et al., 2016), which require the male partner to be strong and overcome the difficulties the couple faces, whereas if it is the female partner who fulfils this function in dyadic coping, it may impair the couple's satisfaction with their relationship.

The cross-sex comparisons for the relative importance of the predictors of relationship satisfaction revealed that the intimacy component of love and having at least one child were more closely associated with men's than women's satisfaction, the former predictor positively, the latter negatively. By contrast, the commitment component of love, the partners' mutual support reflected in positive dyadic coping, and using sex as a means of coping with emotional

problems in the relationship were more closely associated with women's than men's satisfaction, the former two positively, the last one negatively.

In line with related previous findings, the obtained sex differences suggest that women's general satisfaction in intimate partner relationships involves more complex psychodynamics than men's. This is not surprising, considering that women as opposed to men are generally characterized by a wider variety of dyadic coping modes (e.g., Falconier & Kuhn, 2019; Martos et al., 2021) and sexual motives (e.g., Gravel et al., 2020; Meskó et al., 2022), and by more complex experiences of love (e.g., Meskó et al., 2021; Sorokowski et al., 2017). At the same time, this greater complexity is potentially associated with more vulnerable relationship satisfaction in women. That is, the male partner's failure to provide adequate emotional support or to foster a partnership-oriented attitude may drastically impair the female partner's relationship satisfaction.

Some authors point out the importance of a shared perspective as opposed to the pursuit of competing individual interests in terms of long-term satisfaction (e.g., Alea et al., 2015; Topcu-Uzer et al., 2021). Skerrett and Fergus (2015) refers to this shared perspective as we-ness, that is, a third identity shared by the two partners, which is expressed from time to time by symbolic actions mutually done and received as gestures of love rather than costly individual sacrifices. Successful dyadic coping contributes to the development of a shared identity, while a sense of we-ness provides a resource for dyadic coping with the stressors associated with shared activities and responsibilities such as parenting, for example.

Finally, the obtained findings may provide useful insights for practitioners who support committed adult couples in dealing with their differences in relationship satisfaction or dissatisfaction.

There are a number of limitations that have to be addressed. First, the self-report methodology used in the present study was based on the assumption that respondents had conscious access to their psychological contents (e.g., love emotions, sexual motives, dyadic coping functioning), which is not necessarily true in all cases. Second, the overall sample was not tested for representativeness. For example, since the sample is characterized by above-average education and predominantly committed relationships, the results may not be valid for the general population in all respects. Third, no data on the participants' sexual orientation was collected, thus the study enables no conclusion on the associations between sexual orientations and dyadic coping, relationship satisfaction and sexual motivation. Exploration of the possible associations is a subject of future research.

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Competing Interests

The authors have declared that no competing interests exist.

Ethics Statement

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The study received ethical approval as part of a larger research project on mating strategies from the Hungarian United Ethical Review Committee for Research in Psychology (Ref. No. 2018/115).

Author Contributions

Norbert Meskó: Conceptualization, Methodology, Writing - Reviewing and Editing, Funding acquisition, Supervision. Fanni Őry: Data curation, Writing - Original draft preparation. Zsuzsa Happ: Investigation, Writing - Original draft preparation. András N. Zsidó: Formal analysis.

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2.6 Sex- and Age-Specific Patterns of Sexual Motivation in Relation to Emotion Regulation and Dyadic Coping[6]

Norbert Meskó[1]*, Ádám Putz[1], Ferenc Kocsor[1]

[1]University of Pécs, Institute of Psychology, Pécs, Hungary

*Corresponding author

Abstract

Sexual motivation is a multidimensional psychological construct that is linked to a wide range of emotional and relational processes in previous research. This study examines the associations between sexual motivation, emotion dysregulation (i.e., difficulties in emotion regulation), and dyadic coping, focusing on age and sex differences among Hungarian adults through a questionnaire-based approach. Study 1 investigated how self-centered, relationship-oriented, and coping-related sexual motivations correlate with emotion regulation challenges across different ages and sexes. The findings indicate that self-centered sexual motivation is positively associated with overall emotion dysregulation in men but not in women. Additionally, relationship-oriented sexual motivation is negatively associated with age and certain emotion regulation difficulties, while coping-related sexual motivation exhibits distinct patterns of association with emotion regulation challenges between the sexes. Study 1 included 572 cisgender participants (381 women and 191 men), whereas Study 2 involved 466 cisgender participants (312 women and 154 men). Study 2 explored the relationship between sexual motivation and dyadic coping, revealing that self-centered sexual motivation correlates negatively with dyadic coping, particularly among men. Conversely, relationship-oriented sexual motivation was positively associated with supportive dyadic coping behaviors, especially in men. Coping-related sexual motivation showed no significant association with dyadic coping across ages or sexes. These studies highlight the complex interplay between sexual motivation, emotional regulation, and relational dynamics, thus underscoring sex differences and age-related trends. These findings suggest that a more comprehensive understanding of sexual motivation and relationship functioning requires careful consideration of age and sex differences.

Keywords: sexual motivation; emotion regulation; dyadic coping; sex differences; age differences

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1. Introduction

1.1 Sexual Motivation

Sexual motivation, defined as the driving force behind an individual's pursuit of sexual encounters, has profound implications for both individual mental health (e.g. Meskó et al., 2022a; Meston & Buss, 2007) and the quality and functioning of relationships (e.g. Byers, 2005; Impett et al., 2005; Rehman et al., 2011). Research has shown that individuals often use sex to alleviate negative emotions such as loneliness or tension, to improve mood and to maintain their self-perceived attractiveness (Brigman & Knox, 1992; Levinson et al., 1995). Cooper and colleagues (1998) were the first to demonstrate using a sexual motivation questionnaire they developed that coping with emotional difficulties can drive individuals to engage in sexual activity.

Meston and Buss (2007) identified emotional expression as a central component of sexual motives as measured by the Reasons for Having Sex Questionnaire (YSEX?) (e.g. "I wanted to express my love for the person"). These findings were supported by Wyverkens et al. (2018) who found that younger women were more likely to engage in sex to express emotions compared to older women.

Research on sexual motives has consistently revealed significant sex differences. Mark et al. (2014) found that men were more likely than women to cite sexual release, orgasm and their partner's satisfaction as key motivations for sex. In contrast, women reported a stronger desire for intimacy, emotional closeness, love and feeling sexually desirable. Additionally, men tend to report higher levels of sexual desire overall (e.g. Baumeister et al., 2001; Frankenbach et al., 2022; Lippa, 2009; Stephenson et al., 2011) and are more likely to use sexual activity as a means to regulate negative emotions (Gillespie et al., 2021; Raisanen et al., 2018). For instance, Hill and Preston (1996) noted that men are more inclined to use sex to cope with negative mood states. Similarly, Impett et al. (2008) observed that men were more likely to engage in sex to satisfy their partner while women were more likely to do so to maintain their partner's interest in the relationship. Longitudinal findings by McNulty et al. (2019) revealed a sharper decline in sexual desire among women in relationships compared to men. Factors such as childbirth partially contributed to this difference which ultimately predicted declines in marital satisfaction for both partners.

Meston and Buss (2007) proposed that sexual motivation involves a broad range of emotional and instrumental goals which they captured in the Reasons for Having Sex Questionnaire (YSEX?). Subsequent studies using both the original and adapted versions of this questionnaire

(e.g. Meskó et al., 2022a,b) have consistently found that men are more likely to endorse self-centered motives (e.g. sexual release, physical pleasure) whereas women tend to report relational motives (e.g. emotional intimacy, partner connection). These findings are in line with broader patterns suggesting that men's sexual motives are generally more self-focused and less emotionally driven than women's (e.g. Gray et al., 2019; Leigh, 1989; Wyverkens et al., 2018).

Age-related changes in sexual motivation have also been documented particularly within intimate partner relationships. For instance, Gewirtz-Meydan and Ayalon (2019) and Wyverkens et al. (2018) observed a general decline in sexual desire with age. Similar findings were reported by Hatfield and Rapson (2015) and Höglund et al. (2014) emphasizing the role of long-term relational dynamics. Some studies have linked this decline to hormonal factors particularly decreased testosterone levels as noted by Dick et al. (2020), Krapf and Simon (2017) and Maggi et al. (2020). However, the precise relationship between testosterone and sexual desire remains unclear (van Anders, 2012). While younger individuals often prioritize physical attraction and relational reasons, adults over the age of 50 are more likely to seek sexual variety which can lead to infidelity (Meskó et al., 2022a,b). Findings from Wyverkens et al. (2018) corroborate this pattern showing shifts in sexual motives with age when using the original YSEX? questionnaire. These age-related shifts in motivational priorities—such as the decline in relational motives and the increase in personal goal orientation—have been observed across multiple studies using both the original and abbreviated versions of the YSEX? questionnaire (Meskó et al., 2022a,b).

In addition to sex differences, age has also been shown to influence sexual motivation patterns. Several studies suggest a general decline in sexual desire with age (e.g. Gewirtz-Meydan & Ayalon, 2019; Wyverkens et al., 2018) along with shifts in motivational priorities—from physical attraction to emotional intimacy or vice versa.

In summary, men tend to prioritize self-focused sexual objectives while women are more motivated by relational factors. However, both sexes appear equally inclined to use sex as a coping strategy for emotional difficulties. Prior studies have shown that using sex to manage negative emotions is a common phenomenon in both men and women though potentially driven by different psychological factors (e.g. Cooper et al., 1998; Patrick et al., 2011; Meskó et al., 2021, 2022a,b). These findings underline the importance of considering sex-specific emotional and motivational contexts when examining coping-related sexual behavior. These patterns likely reflect the complex interplay between evolved tendencies and socially constructed gender roles which shape men's and women's experiences and expressions of sexual motivation in context-specific ways (e.g. Petersen & Hyde, 2010).

Given the frequent use of sex to regulate emotional distress, it is important to examine the role of emotion regulation capacities in shaping sexual motivations.

1.2 Emotion Regulation

Emotion regulation refers to the processes through which individuals influence their own or others' emotional experiences (Gross & John, 2003). According to Gratz and Roemer (2004), effective regulation of negative emotions involves several key components: attending to and becoming aware of one's emotional experiences, clarifying the emotions being experienced, accepting negative emotions without judgment, flexibly applying appropriate emotion regulation strategies, controlling impulsive emotional reactions and maintaining goal-directed behavior despite negative emotions. In essence, emotion regulation requires both understanding and accepting emotions and employing strategies to modulate and manage them (Gratz & Roemer, 2004; Viana-Sousa et al., 2023). Conversely, failures in emotion regulation can lead to emotion dysregulation (Westerlund & Santilla, 2018) which is associated with poorer sexual health outcomes, difficulties in the sexual response cycle and reduced overall sexual satisfaction as demonstrated by Fischer et al. (2022) in a meta-analysis of 27 studies across diverse methodologies.

Research indicates notable gender differences in emotional experiences and emotion regulation strategies. Men often struggle with accepting and controlling negative emotions (Gratz & Roemer, 2004) whereas women face challenges in clearly understanding and identifying their emotions (Kaur et al., 2022). Additionally, men are more likely to rely on emotional suppression (Gross & John, 2003) while women employ a wider array of emotion regulation strategies (Nolen-Hoeksema & Aldao, 2011) and are more often motivated by relational concerns in regulating their emotions (Timmers et al., 1998). Women also experience lower perceived threat when sharing sensitive personal information with other women compared to sharing with men (Mendes et al., 2003).

In romantic relationships, emotional processes play a pivotal role in maintaining relationship stability and satisfaction (Johnson, 2019). While emotions are often regarded as individual experiences (Cotrufo & Bares, 2018) and emotion regulation is typically seen as serving personal goals, Stephens et al. (2022) suggest that romantic partners regulate emotions both individually and collaboratively within the unique dynamics of their relationship. This concept of shared emotion regulation is grounded in the principle of interdependence which posits that individuals in a relationship mutually influence each other's emotional experiences (Van Lange & Balliet, 2015). Consequently, difficulties in emotion regulation at the individual level can disrupt the shared emotion regulation process and affect relationship stability (Viana-Sousa et

al., 2023). Individuals who struggle to understand and regulate their own emotions may also find it challenging to comprehend their partner's emotions (Tani et al., 2015). As such, these difficulties can diminish relationship quality, reduce satisfaction and increase the likelihood of relationship dissolution (Rick et al., 2017).

In this context, the term sexual emotions refers to affective experiences that arise during or in anticipation of sexual activity, including emotions such as desire, arousal, embarrassment, guilt, satisfaction and emotional intimacy. The regulation of sexual emotions is closely linked to overall relationship quality. Sexual experiences can be viewed as outcomes of emotion regulation strategies involving the dynamic interplay of cognitive, affective and motivational processes (Birnbaum & Muise, 2025; Shi et al., 2025). Individual partner characteristics, relational dynamics and the broader social context collectively influence how sexual emotions are experienced and regulated. Dysregulation of sexual emotions can make partners more vulnerable to sexual problems as noted by Rosen and Bergeron (2019).

Emotion regulation skills generally improve with age (Miguel et al., 2025; Urry & Gross, 2010). Orgeta (2009) found that age was positively associated with both the clarity of emotional experiences and access to effective emotion regulation strategies. Similarly, research by Charles and Carstensen (2007), Miguel et al. (2017), Staples and Mohlman (2012) and McConatha and Huba (1999) supports the observation that emotion regulation becomes increasingly effective with age. These findings suggest that as individuals age, they gain greater capacity to manage emotional experiences which may extend to the regulation of sexual emotions as well.

Since romantic relationships involve mutual emotional influence, the regulation of emotions often extends beyond the individual and takes place within dyadic interactions as explored in the following section.

1.3 Dyadic Coping

Although emotion regulation is closely intertwined with coping, key distinctions have been identified between the two concepts at the individual level (e.g. Levesque et al., 2014). The primary difference lies in the broader scope of coping, which encompasses not only internal emotional processes but also external challenges and adaptive responses to these challenges (Wang & Saudino, 2011). Moving beyond individual-focused approaches, the systemic perspective of dyadic coping (DC) posits that stressors in a shared environment influence both partners in a dyadic relationship (for a review see Falconier & Kuhn, 2019). Dyadic stressors can be either direct, affecting both partners simultaneously (e.g. financial difficulties) or indirect, initially impacting one partner before extending to the relationship and eventually affecting both partners (e.g. a health condition). The dyadic approach reconceptualizes stress and coping

as relational rather than purely individual processes (e.g. Bodenmann, 1995). When faced with dyadic stressors, partners draw on shared psychological resources to manage the threat. Effective coping depends on both partners being attuned to their own and each other's feelings, communicating about them and working collaboratively to restore relationship satisfaction and maintain dyadic functioning (Bodenmann, 1997).

Research has highlighted the role of individual cognitive emotion regulation strategies such as positive reappraisal and perspective-taking in facilitating DC. Rusu et al. (2019) found that these strategies are linked to the ability of partners to support one another and engage in DC. Emotion regulation plays a pivotal role in stress communication and dyadic coping processes. Effective DC is influenced by how well partners manage their own negative emotions and respond to their partner's expressions of stress (Falconier et al., 2023). A lack of emotional awareness, clarity or acceptance can hinder the ability to perceive and respond to a partner's emotions, potentially resulting in unsupportive or negative reactions (Zhang et al., 2024).

For DC to function effectively, partners must recognize and communicate their stress and seek support, whether implicitly or explicitly. This process requires emotional awareness, clarity and acceptance of both one's own and one's partner's emotions. Falconier et al. (2023) identified these three dimensions as critical for partners to share stress and support each other in regulating negative emotions and managing external challenges. Successful stress communication can activate mutual DC responses, enhancing joint coping efforts. In other words, partners with greater emotional awareness, clarity and acceptance are more likely to effectively communicate stress, receive support and strengthen their relationship through collaborative coping.

Studies on DC have yielded mixed findings regarding sex differences. For instance, Falconier et al. (2015) found no significant sex differences in the relationship between DC and relationship satisfaction in their meta-analysis, whereas Bodenmann et al. (2016) reported that this association varies by country with stronger effects observed for men in some nations and for women in others. Other studies have found asymmetries: men's relationship satisfaction is significantly influenced by their female partner's DC, while women's satisfaction is often unaffected by their male partner's DC behaviors (Herzberg et al., 2013; Papp & Witt, 2010). In contrast, Bodenmann et al. (2006) found that women's marital quality was predicted by both partners' DC, whereas men's marital quality was influenced only by their own DC. These findings align with evidence that women typically play a more central role in maintaining relationships as reflected in their higher levels of self-reported commitment and more frequent engagement in relationship maintenance behaviors.

Further research suggests that women use a broader range of DC strategies than men and exhibit more complex psychodynamics in their satisfaction with intimate relationships (e.g. Falconier & Kuhn, 2019; Martos et al., 2021; Meskó et al., 2022c). Falconier et al. (2023) observed sex differences in stress communication and supportive DC responses, with women managing their negative emotions in ways that are adaptive for individual well-being but not always beneficial for dyadic functioning. Overall, these findings suggest that women's satisfaction with relationships depends on a more intricate interplay of emotional, cognitive and relational factors compared to men. These inconsistencies may stem from methodological variations across studies, such as differences in sample characteristics, cultural norms or the types of stressors examined. Additionally, sex differences in DC may be context-dependent, with women's coping behaviors more strongly shaped by relational expectations and men's by individual stress appraisals (Tang et al., 2023).

Age also influences DC effectiveness. Consistent with research linking age to improved emotion regulation, studies have demonstrated a positive association between age and DC. Bodenmann and Widmer (2000) found that older couples used fewer DC strategies overall but relied on them more effectively. Landis et al. (2013) suggested that DC among older adults contributes to maintaining relationship satisfaction in the face of aging and long-term marital challenges. Similarly, Acquati and Kayser (2019) observed that younger women with breast cancer and their partners reported lower scores for both DC and quality of life compared to middle-aged couples. These findings align with research showing that age is positively correlated with relationship-related problem-solving (e.g. Aldwin et al., 2021; Berg & Upchurch, 2007; Johnson et al., 2016; Rohr et al., 2019; Schade et al., 2020).

Despite the growing body of literature on sexual motivation, emotion regulation and dyadic coping, these domains have largely been investigated in isolation. To date, no empirical studies have systematically examined how specific difficulties in emotion regulation (i.e. emotion dysregulation) and dimensions of dyadic coping relate to distinct types of sexual motivation (i.e. self-centered, relational and coping-related), nor how these associations may differ across age and sex. Furthermore, most prior research has focused on isolated constructs without integrating them into a unified framework that reflects the complexity of sexual behavior in romantic contexts.

Therefore, the present research aims to address this gap by conducting two empirical studies. Study 1 examines the associations between sexual motivation and difficulties in emotion regulation, with a focus on age- and sex-specific patterns. Study 2 investigates how sexual motivation is related to dyadic coping dimensions, again considering the moderating effects of

age and sex. Together, these studies offer a novel integrative perspective on the psychological and relational factors that shape sexual motivation in adulthood.

2 Study 1

2.1 Research Aims and Hypotheses

Study 1 aimed to examine potential age and sex differences in the relationship between sexual motivation and difficulties in emotion regulation. As no prior studies have addressed this topic using either the original Reasons for Having Sex Questionnaire (YSEX?; Meston & Buss, 2007) or its Hungarian adaptation (YSEX?-HSF; Meskó et al., 2022a), the following hypotheses were formulated based on the empirical findings presented in the theoretical introduction.

Hypothesis 1A Self-centered sexual motivation is expected to be positively associated with age.

Hypothesis 1B Among men, but not women, self-centered sexual motivation is hypothesized to be positively associated with emotion dysregulation, as measured by the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004).

Hypothesis 2A Relationship-oriented sexual motivation is hypothesized to be negatively associated with age.

Hypothesis 2B Emotion dysregulation is expected to be negatively associated with age.

Hypothesis 2C Relationship-oriented sexual motivation is hypothesized to be negatively associated with specific difficulties in emotion regulation.

Hypothesis 3A Coping-related sexual motivation is hypothesized to be unrelated to age.

Hypothesis 3B Coping-related sexual motivation is expected to be positively associated with emotion dysregulation (DERS total score) for both men and women. In addition, we hypothesize that the strength and/or direction of the associations between coping-related sexual motivation and the specific emotion regulation difficulties (as measured by the six DERS subscales) will differ between men and women.

2.2. Method

2.2.1. Participants and Procedure

The study employed a cross-sectional survey design, using self-report questionnaires to assess sexual motivation and emotion regulation difficulties. Data were collected online via the Qualtrics platform, and the study was promoted on Facebook. Participation was voluntary, anonymous, and required informed consent.

A total of 576 participants completed the survey, including 395 women, 177 men, and 4 individuals who identified as transgender. Due to the extremely small number of transgender

respondents, their data were excluded from analysis. This decision was based on analytic considerations, as well as prior research indicating that transgender individuals may differ in sexual motivation and mating psychology from cisgender individuals (e.g., de Menezes Gomes et al., 2020; Jacobson & Joel, 2021). Including them in the cisgender group would have introduced conceptual and statistical heterogeneity without sufficient power for subgroup analyses.

The final sample consisted of 572 voluntary participants (see demographic details in Table 1). Data collection was conducted online using the Qualtrics platform, with the survey disseminated via Facebook. All participants provided informed consent, and no monetary or other compensation was offered for participation.

Both research plans for Study 1 and Study 2 were approved by the Hungarian United Ethical Review Committee for Research in Psychology (Ref. No. 2018/115), ensuring compliance with ethical standards. The sample sizes for both studies were determined through convenience sampling, based on participant availability and willingness to participate. Practical constraints, including limitations in time, funding, and participant access, influenced the recruitment process. Data were collected between February and May 2017 as part of a larger research project on psychological aspects of sexuality and romantic relationships.

No a priori power analysis was conducted, as the study was exploratory in nature and no prior estimates of effect sizes were available for the key interactions. Sample size was determined based on participant availability, access, and logistical constraints.

2.2.2. Measures

2.2.2.1. Hungarian Short Form of the Reasons for Having Sex Questionnaire (YSEX?-HSF).

The YSEX?-HSF (Meskó et al., 2022a) is a 73-item self-report measure designed to assess sexual motivation. The questionnaire was developed by replicating the procedure employed in the development of the original American YSEX? (Meston & Buss, 2007). The YSEX?-HSF is composed of three scales (as opposed to the four scales comprising the original YSEX?), each measuring a specific type of sexual motive, including Personal Goal Attainment, measuring self-centered sexual motivation (e.g., *I wanted to seek experience*), Relational Reasons, assessing relationship-oriented sexual motivation (e.g., *I wanted to celebrate*), and Sex as Coping, which measures the motivation for coping with relationship-related problems by engaging in sexual activity (e.g., *I wanted to retain the relationship*"). Response to each item is given on a 5-point rating scale according to how frequently the respondent's sexual activity was motivated by the specific reason in the past, ranging from *None of my sexual experiences* (1) to *All of my sexual experiences* (5). Higher scores on each scale indicate higher levels of the

specific sexual motive assessed. Cronbach's αs for Personal Goal Attainment, Relational Reasons, and Sex as Coping were .91, .93, and .92, respectively.

2.2.2.2. Difficulties in Emotion Regulation Scale (DERS).

The DERS (Gratz & Roemer, 2004; Hungarian adaptation by Kökönyei et al., 2014) is a 36-item self-report measure of emotion dysregulation. Each of its six subscales assesses a specific emotion regulation difficulty affecting functions such as accepting emotional responses (Non-Acceptance), maintaining goal-directed behavior (Goals), maintaining behavioral control and regulation when experiencing (negative) emotional impulses (Impulse), attention to internal affective signals (Awareness), access to emotion regulation strategies (Strategies), and emotional clarity (Clarity). Response to each item is given on a 5-point rating scale according to how frequently the respondent experiences the specific difficulty, ranging from *Almost never* (1) to *Almost always* (5), Higher scores on each subscale indicate more frequent experiences of the specific emotion regulation difficulty. Cronbach's αs for Non-Acceptance, Goals, Impulse, Awareness, Strategies, and Clarity were .88, .91, .89, .77, .92, and .36, respectively.

2.2.2.3. Statistical Analysis.

The effects of emotion regulation difficulties on sexual motivation were tested with Generalized Linear Mixed Models (GLMM; Laird & Ware, 1982) with normal probability distribution and identity as a link function, using IBM SPSS Statistics v. 26.0. In each model, one of the six DERS subscales was entered along with sex and age as predictors, and one of the three YSEX?-HSF scales was entered as the target variable. Furthermore, the hypothesized sex differences in the relationship between emotion dysregulation and sexual motivation were tested by entering an interaction term combining sex and each DERS subscale in each model. A set of interaction-free models were also tested to assess the change in each YSEX?-HSF scale score in response to a one-point change in each DERS subscale score (for GLMM statistics, see Table 3 and Supplementary Material). Finally, the expected associations between emotion regulation difficulties and age were tested with correlation analyses (see Table S6.1-S.6.21) using Jamovi (Jamovi Project, 2022).

Although the study was not preregistered and a relatively large number of GLMMs were conducted, we did not apply formal Bonferroni corrections. Instead, we considered the pattern and consistency of significant findings, most of which had p-values well below conventional significance thresholds (e.g., $p < .001$). The analyses were hypothesis-driven, and each model tested a theoretically grounded association. We provide full model specifications, parameter estimates, and p-values in the Supplementary Materials to ensure transparency and allow

readers to assess the robustness of the results. Detailed model specifications, parameter estimates, and significance values are reported in the Supplementary Materials.

All data are available at

https://osf.io/kv4rt/?view_only=75bfdae540294a2bbe0891a1cd6b9d55.

2.2.3. Results: Effects of Emotion Regulation Difficulties on Sexual Motivation

All GLMMs were significant, including those with and without interaction terms (Tables S5.1-S6.21), and all but one model revealed at least one significant fixed effect, the exception being the model with Awareness as a predictor and Personal Goal Attainment as the outcome.

Personal Goal Attainment was not significantly predicted by age, while it was positively predicted by the interaction between sex and overall emotion dysregulation (DERS total score). More specifically, Personal Goal Attainment showed a larger increase with overall emotion dysregulation among men than among women (Figure 1). An analysis of the contribution of each specific emotion regulation difficulty (DERS subscale scores) revealed that the effect was caused by Non-Acceptance (Figure 2), Impulse (Figure 3), and Strategies (Figure 4), all of which showed the same significant interaction with sex. The interaction-free GLMMs (Table S6.1-S6.7) revealed that Personal Goal Attainment was positively predicted by each specific emotion regulation difficulty except Awareness, which had no significant fixed effect. The most influential emotion regulation difficulty was Clarity, a one-point increase in which was associated, on average, with a .97-point increase in Personal Goal Attainment (for the other fixed coefficients, see Supplementary Material).

Relational Reasons were negatively predicted by age in each related GLMM. A one-year increase in age was associated with an approximately .50-point decrease in Relational Reasons (e.g. the respective decreases were .41 and .54 point for the models including the DERS total score and Awareness as predictors). As revealed by the fixed coefficients for each specific emotion regulation difficulty in the interaction-free GLMMs (S6.8-S6.8.17), Relational Reasons were predicted positively by Non-Acceptance, Impulse, and Strategies, and negatively by Awareness, while no significant effect was obtained for Goals.

Sex as Coping was not significantly predicted by age, while ambiguous results were obtained for the effect of sex, which largely depended on the specific emotion regulation difficulty entered as a predictor. With Awareness as a predictor, Sex as Coping was higher for men than for women on average (i.e., when Awareness and age were kept constant; see Figure 5), while it showed a larger increase with Awareness among women than among men. With either Non-Acceptance or Strategies as a predictor, by contrast, women scored higher on Sex as Coping than men, while a larger increase in Sex as Coping was obtained for men than for women

(Figure 6-7).With Impulse as a predictor, no significant mean difference was found between men and women in Sex as Coping, while a larger increase in Sex as Coping was obtained for men than for women (Figure 8). The fixed coefficients for the interaction-free GLMMs revealed that Sex as Coping was positively predicted by each specific emotion regulation difficulty, the largest per-unit increase in the outcome (1.89 points) associated with Clarity.

2.2.4. Discussion

Study 1 investigated age and sex differences in the associations between sexual motivation and emotion regulation difficulties. The results did not support Hypothesis 1A, as Personal Goal Attainment was not significantly predicted by participants' age. However, Hypothesis 1B was partially confirmed: self-centered sexual motivation was positively predicted by overall emotion dysregulation among men but not among women. Specifically, male participants' difficulties with accepting emotional reactions, controlling impulses, and accessing adaptive emotion regulation strategies were positively associated with the importance they attached to Personal Goal Attainment. These findings suggest that men may be more likely to engage in self-focused sexual behavior when experiencing emotion regulation difficulties, potentially using sexual activity as a way to compensate for emotional dysregulation. This pattern may reflect gendered coping mechanisms shaped by both psychological vulnerability and socialized expectations around emotional expression and intimacy.

Both Hypothesis 2A and Hypothesis 2B were supported. Age was negatively associated with both emotion dysregulation and relationship-oriented sexual motivation. Hypothesis 2C, however, was only partially confirmed. While Relational Reasons were negatively associated with a lack of emotional awareness, contrary to expectations, positive correlations were observed with non-acceptance of emotional reactions, impulse control difficulties, and limited access to adaptive emotion regulation strategies. These mixed findings may reflect the dual nature of relational motives, which involve not only emotional connection but also interpersonal vulnerability. When individuals struggle with emotion regulation, they may simultaneously seek closeness and fear rejection, resulting in ambivalent motivational patterns.

Finally, Hypothesis 3A was confirmed by the absence of an association between Sex as Coping and age. Hypothesis 3B was also supported by the observed sex differences in the associations between Sex as Coping and emotion regulation difficulties. Specifically:

- When Awareness was included as a predictor and other predictors (except sex) were held constant, men scored higher on Sex as Coping than women. Additionally, a per-unit increase in Awareness was associated with a larger increase in Sex as Coping among women than among men.

- In contrast, when Non-Acceptance, Impulse, or Strategies was included as a predictor, women scored higher than men on Sex as Coping when all other predictors (except sex) were held constant. However, for men, a larger increase in Sex as Coping was observed for each of these predictors compared to women.

These results underline that while both men and women may turn to sex as an emotion regulation strategy, the underlying mechanisms and triggers differ by sex (Huțul et al., 2024; Ndungu et al., 2025). This supports the idea that sexual behavior can serve distinct psychological functions across genders, especially in the face of emotional difficulties.

3. Study 2

3.1. Research Aims and Hypotheses

Study 2 aimed to examine potential age and sex differences in the relationship between sexual motivation and dyadic coping (DC), as measured by the Dyadic Coping Inventory (DCI; Bodenmann, 2008) and its subscales: common DC (DCO), partner-focused DC (DCP), and negative DC (NDC). As no previous studies have investigated this relationship using either the original Reasons for Having Sex Questionnaire (YSEX?; Meston & Buss, 2007) or its Hungarian adaptation (YSEX?-HSF; Meskó et al., 2022a), the following hypotheses were developed based on the empirical findings presented in the theoretical introduction.

Hypothesis 4A Consistent with prior findings (Meskó et al., 2022a, b), Personal Goal Attainment is expected to be positively associated with age.

Hypothesis 4B In line with previous research (Meskó et al., 2022a, b), men are hypothesized to score higher than women on Personal Goal Attainment.

Hypothesis 4C Personal Goal Attainment is expected to be negatively associated with all dimensions of dyadic coping, including individual DC (DCI), common DC (DCO), partner-focused DC (DCP), and negative DC (NDC).

Hypothesis 5A Consistent with findings by Meskó et al. (2022a, b), Relational Reasons are hypothesized to be negatively associated with age.

Hypothesis 5B Relational Reasons are expected to be positively associated with positive dyadic coping strategies, including DCI, DCO, and DCP, but not with negative DC (NDC).

Hypothesis 5C In line with Meskó et al. (2022b), Relational Reasons are expected to exhibit a stronger association with dyadic coping among men than among women, as women are generally hypothesized to score higher than men on Relational Reasons, regardless of the quality of DC.

Hypothesis 6A Consistent with prior findings (Meskó et al., 2022a, b), the relationship between Sex as Coping and dyadic coping is not expected to be influenced by age.

Hypothesis 6B The associations between Sex as Coping and individual dyadic coping (DCI) are hypothesized to show sex differences.

3.2. Method

3.2.1. Participants and Procedure

Study 2 was conducted using a cross-sectional online survey design, aimed at assessing the associations between sexual motivation and dyadic coping. Data collection was carried out using the Qualtrics platform, with participant recruitment conducted via Facebook. Participation was voluntary, anonymous, and based on informed consent.

A total of 468 participants completed the survey, including 329 women, 137 men, and 2 individuals who identified as transgender. Due to the extremely small number of transgender respondents, their data were excluded from analysis. This decision was based on analytic considerations, as well as prior research indicating that transgender individuals may differ in sexual motivation and mating psychology from cisgender individuals (e.g., de Menezes Gomes et al., 2020; Jacobson & Joel, 2021). Including them in the cisgender group would have introduced conceptual and statistical heterogeneity without sufficient power for subgroup analyses. The final sample consisted of 466 voluntary participants (see demographic details in Table 1). The ethical considerations described in Section 2.2.1 also apply to Study 2. Data were collected between February and May 2017 as part of a larger research project on psychological aspects of sexuality and romantic relationships.

As in Study 1, no a priori power analysis was performed due to the exploratory nature of the study and the absence of prior effect size estimates. The final sample size reflects the total number of participants who voluntarily completed the survey within the data collection period.

3.2.2. Measures

3.2.2.1. Hungarian Short Form of the Reasons for Having Sex Questionnaire (YSEX?-HSF)

The YSEX?-HSF was previously detailed in Section 2.2.2.1. For Study 2, internal consistency values (Cronbach's α) were .90 for Personal Goal Attainment, .92 for Relational Reasons, and .89 for Sex as Coping, indicating excellent reliability for each scale.

3.2.2.2. Dyadic Coping Inventory (DCI).

The 37-item DCI (Bodenmann, 2008; Hungarian adaptation by Martos et al., 2012) is a self-report instrument designed to evaluate different strategies for managing relationship stress. The DCI assesses dyadic coping (DC) from two perspectives: one's own DC actions (i.e., how

the respondent copes when their partner is stressed) and perceptions of the partner's DC actions (i.e., what the respondent believes their partner does when the respondent is stressed). Responses are recorded on a 5-point Likert scale ranging from *Very rarely* (1) to *Very often* (5). In Study 2, we employed four aggregate DC scales, consistent with standard practice. One's Own DC (DCO) involves the individual's problem-solving efforts to address relationship stress (e.g., "*I tell my partner openly how I feel and that I would appreciate his/her support*"). Partner's DC (DCP) includes perceiving the partner's emotions and responding collaboratively, which may involve taking over stressful tasks (e.g., "*My partner shows me through his/her behavior that he/she is not doing well or when he/she has problems*"). Negative DC (NDC) includes supportive efforts characterized by hostility, ambivalence, or stereotypical behaviors, such as simultaneously providing support and criticizing the partner (e.g., "*I provide support but do it so unwillingly and unmotivated because I think that he/she should cope with his/her problems on his/her own*"). Positive DC (PDC) involves supportive behaviors that do not take over the partner's coping process but instead enhance the partner's coping abilities through empathetic, emotion-focused understanding or problem-focused assistance (e.g., " *When my partner feels he/she has too much to do, I help him/her out*"). Cronbach's α for DCO, DCP, NDC, and PDC were .80, .88, .80, and .91, respectively.

3.2.3. Statistical Analysis

Similarly to the procedure employed in Study 1 (see 3.3.), the hypothesized effects of DC on sexual motivation were tested with two sets of GLMMs with normal probability distribution and identity as a link function (see Table S7.1-S8.15). In one set of models, each of the four DCI scales was entered along with sex and age as predictors, and each of the three YSEX?-HSF scales was entered as the target variable. Furthermore, the hypothesized sex differences in the relationship between DC and sexual motivation were tested by entering an interaction term combining sex and each DCI scale in each model. The other set of models replicated the first set without interaction terms.

To address the increased risk of Type I error due to multiple hypothesis testing, Bonferroni corrections were applied across the GLMM models. The complete model specifications, including interaction terms and estimated marginal means, are available in the Supplementary Material.

All data are available at https://osf.io/kv4rt/?view_only=75bfdae540294a2bbe0891a1cd6b9d55. This study’s design and its analysis were not pre-registered.

3.3. Results: Effects of DC on Sexual Motivation

Age did not significantly contribute to the predictive power of any of the tested models.

Personal Goal Attainment was significantly predicted by all related models, including those with and without an interaction term. In all of these models except those with NDC as a predictor, sex significantly predicted the target variable either as part of an interaction term or as an independent predictor. Specifically, significant interactions were observed for the DCI total score (Figure 9) and DCO (Figure 10), whose per-unit increases were respectively associated with a decrease in Personal Goal Attainment larger by .14 and .45 point for men than for women, due to women's relatively low and stable baseline level of Personal Goal Attainment, and men's higher baseline level of, and DCI-related decline in the same measure. No other significant interaction effect was found. With DCP and PDC as predictors, men scored higher than women on Personal Goal Attainment when all predictors except sex were held constant (see Figure 11-12). The interaction-free models revealed that per-unit increases in DCP and NDC were respectively associated with a .12-point decrease and a .39-point increase in Personal Goal Attainment.

Relational Reasons were significantly predicted by all related models except those with NDC as a predictor. Sex was a significant predictor only in the interaction-free models with the DCI total score, DCO, DCP and PDC as predictors. In all of these models, men scored higher than women on Relational Reasons, while the fixed coefficients indicated positive associations between the target variable and each DC measure.

Sex as Coping was only predicted significantly by the interaction-free model with NDC as a predictor. A one-point increase in NDC was associated with a .37-point increase in Sex as Coping.

3.4. Discussion

Study 2 investigated age and sex differences in the relationship between sexual motivation and dyadic coping (DC). The results revealed that while age did not influence the associations between sexual motives and various aspects of DC (confirming Hypothesis 4A), these associations displayed significant sex differences (confirming Hypothesis 4B). Consistent with previous findings (Meskó et al., 2021, 2022a, b), men scored higher than women on Personal Goal Attainment. Although Partner-Focused Dyadic Coping (DCP; e.g., "My partner shows empathy and understanding to me") was negatively associated with self-centered sexual motivation regardless of sex, both the Individual Dyadic Coping total score (DCI; i.e., overall dyadic coping) and Common Dyadic Coping (DCO; i.e., the respondent's coping efforts) exhibited significantly stronger negative associations with Personal Goal Attainment among men than among women. These sex differences necessitate a refinement of Hypothesis 4C, which

predicted a negative association between self-centered sexual motivation and DC across all participants and DC dimensions, irrespective of sex. These findings suggest that self-centered sexual motivation may interfere with collaborative and partner-oriented coping behaviors, particularly among men. This could reflect gendered coping dynamics, whereby men with strong individual goals may disengage from mutual problem-solving in intimate relationships, potentially due to differing expectations around autonomy and support.

For men, Relational Reasons (i.e., relationship-oriented sexual motivation; e.g., "We were made for each other") were positively predicted by all DCI measures except Negative Dyadic Coping (NDC; e.g., "When my partner is stressed, I tend to withdraw"). These results support Hypotheses 5A–5C and align with prior research demonstrating the positive relationship between relationship-oriented sexual motivation and mutually supportive dyadic coping interactions (Beaulieu et al., 2022; Falconier & Kuhn, 2019; Gewirtz-Meydan & Finzi-Dottan, 2018; Randall et al., 2022). This pattern underscores the potential role of relationship-oriented sexual motives in fostering emotional intimacy and mutual responsiveness. For men in particular, aligning sexual behavior with relational goals may enhance their engagement in supportive coping strategies, counterbalancing traditional masculine norms of emotional restraint.

Sex as Coping (i.e., using sexual activity to address relationship challenges; e.g., "I wanted to comfort the other person") was not significantly predicted by any of the tested Generalized Linear Mixed Models (GLMMs), except for the interaction-free model, where NDC emerged as a marginally significant positive predictor. These findings confirm Hypothesis 6A, which posited that age does not influence the relationship between Sex as Coping and DC. However, they do not support Hypothesis 6B, which predicted sex differences in the associations between Sex as Coping and various DC dimensions. The absence of strong associations between Sex as Coping and dyadic coping may indicate that this sexual motivation is less influenced by external relational dynamics and more shaped by internal emotion regulation needs. The marginal role of negative DC could suggest that in less functional relationships, sex is more readily used to manage relational tension rather than build closeness.

4. General Discussion

The present studies examined the associations between sexual motivation, emotion regulation difficulties and dyadic coping (DC), along with the potential effects of age and sex on these relationships. The hypotheses were grounded in previously observed age and sex differences in these domains (for sexual motivation see Meskó et al., 2022a, b; Meston & Buss, 2007; Wyverkens et al., 2018; for emotion regulation see Kaur et al., 2022; Gratz & Roemer, 2004;

Nolen-Hoeksema & Aldao, 2011; Orgeta, 2009; Urry & Gross, 2010; for DC see Bodenmann et al., 2016; Falconier et al., 2023; Landis et al., 2013; Meskó et al., 2022c). Given the absence of prior studies with a similar focus, these findings offer novel insights into the interplay of these constructs.

4.1 Sex Differences

The results demonstrated that self-centered sexual motivation was more strongly associated with overall emotion dysregulation among men than among women, confirming part of the expectations. Each specific emotion regulation difficulty, except lack of emotional awareness, significantly influenced self-centered sexual motivation. These findings align with previous studies suggesting that negative emotions can drive self-centered sexual activity aimed at alleviating distress rather than fostering shared sexual experiences (e.g., Beaulieu et al., 2022; Fischer et al., 2022, 2023; Smith & Doe, 2024).

An intriguing result concerns sex differences in the relationship between coping-related sexual motivation and specific emotion regulation difficulties. While men were more motivated than women to use sex as a coping mechanism when controlling for emotional awareness and age, a lack of emotional awareness had a stronger effect on coping-related sexual motivation among women. Conversely, non-acceptance of emotional responses, impulse control difficulties and limited access to emotion regulation strategies showed the opposite pattern. These findings echo earlier research indicating that men and women are equally motivated to use sex as a coping mechanism but do so in sex-specific ways (Cooper et al., 1998; Meskó et al., 2022a, b; Stephenson et al., 2011). They also align with observed sex differences in emotion regulation (e.g., Kaur et al., 2022; Timmers et al., 1998; Viana-Sousa et al., 2023).

Regarding DC, self-centered sexual motivation was negatively associated with both partner-focused coping efforts and negative DC responses, with stronger negative effects of overall DC and the participants' own coping efforts observed among men than among women. This suggests that the quality of DC plays a more crucial role for men than for women in the context of self-centered sexual activity, which is typically more characteristic of men.

Men's relationship-oriented sexual motivation was positively associated with all aspects of DC except negative DC. These results align with previous findings highlighting the importance of mutual dyadic coping and relationship satisfaction (Veltenet al., 2025). Some researchers emphasize the role of shared perspectives over competing individual interests in achieving long-term satisfaction (Alea et al., 2015; Topcu-Uzer et al., 2021). This shared perspective, often referred to as "we-ness," reflects a dyadic identity manifested in symbolic actions, such as expressions of love (Meskó et al., 2022c), rather than individual sacrifices.

Effective DC promotes the development of a shared identity which can serve as a valuable resource for managing joint responsibilities in long-term relationships (e.g., financial decisions, household tasks, or parenting).

Coping-related sexual motivation was positively associated with negative DC among both men and women, suggesting that inadequate DC fosters hostility, emotional detachment, and low commitment, impairing sexual desire and satisfaction (Bodenmann, 2005). These challenges may, in turn, increase partners' motivation to use sex as a coping strategy. Alternatively, it is also plausible that increased motivation to use sex for coping exacerbates negative DC responses.

4.2 Age Differences

Contrary to expectations, self-centered sexual motivation was not significantly influenced by age. This inconsistency may be explained by differences in sample composition, particularly regarding relationship status. Self-centered sexual motivation is linked to short-term mating strategies (Crosby et al., 2021; Meston & Buss, 2007), which are more relevant to casual sexual encounters than to long-term relationships. The present studies included a high proportion of participants in committed relationships (approximately 93%), much higher than in previous studies (59–85%; Meskó et al., 2022a, b), potentially limiting sample heterogeneity.

The expected negative association between emotion dysregulation and age was confirmed, consistent with prior research (Charles & Carstensen, 2007; Gaffey et al., 2016; Jarvis et al., 2023; Miguel et al., 2017; Orgeta, 2009). Similarly, the expected negative association between relationship-oriented sexual motivation and age was supported, replicating previous findings (Meskó et al., 2022a,b; Wyverkens et al., 2018). Finally, age did not significantly influence coping-related sexual motivation or its relationship with DC, confirming the related predictions.

In summary, the findings of the present studies highlight the intricate interplay between sexual motivation, emotion regulation difficulties, and dyadic coping, revealing distinct patterns influenced by both age and sex. These results contribute to a deeper understanding of the psychological mechanisms underlying sexual behavior and its relational context, offering valuable insights into adaptive and maladaptive dynamics.

5. Limitations

The present studies have several limitations that should be acknowledged when interpreting the findings. First, the reliance on self-report measures for assessing sexual motivation assumes that individuals have conscious access to their underlying motives, which may not

always hold true. This methodological limitation is further compounded by the potential for social desirability bias, as participants might have been inclined to provide responses perceived as socially acceptable rather than entirely accurate. Another limitation stems from the absence of data on participants' sexual orientation, which restricted the scope of analysis and precluded any exploration of how sexual orientation might influence the relationships between sexual motivation, emotion regulation, and dyadic coping. Additionally, the cross-sectional design of the studies imposes constraints on the interpretation of age effects, as observed differences may reflect generational or cohort-specific factors rather than developmental trajectories. Furthermore, the study samples comprised a disproportionately high percentage of participants in committed relationships, which may limit the generalizability of findings, particularly regarding self-centered sexual motivation, as this dimension is more characteristic of short-term mating strategies. These limitations underscore the need for longitudinal studies with more diverse samples to explore the developmental and contextual nuances of sexual motivation and its interplay with emotional and relational dynamics.

6. Conclusions

The present studies provide significant insights into the interplay between sexual motivation, emotion regulation difficulties, and dyadic coping, revealing notable differences shaped by both age and sex. These findings highlight the complexity of human sexual behavior as it intersects with emotional and relational processes, suggesting that sexual motivation is not merely an isolated construct but an adaptive component of broader mating strategies. The observed sex differences underscore the distinct mating psychologies of men and women, reflecting evolutionary pressures and socio-relational challenges that have shaped their psychological adaptations in the mating domain.

Age-related patterns, though less pronounced, provide additional evidence for the developmental and contextual influences on sexual motivation and its associations with emotion regulation and dyadic coping. The findings align with existing literature suggesting that sexual motives and patterns of emotion dysregulation evolve over the lifespan, influenced by shifting priorities and relational contexts. However, the lack of association between age and self-centered sexual motivation in these studies may point to the moderating role of relationship status, emphasizing the need for further exploration in more heterogeneous samples.

Overall, these results contribute to a growing body of research supporting the notion that sexual motivation serves critical psychological and relational functions, deeply embedded within the broader context of human adaptation. Future research should aim to unravel the

longitudinal and cultural nuances of these relationships, particularly by addressing the limitations outlined, to provide a more comprehensive understanding of the dynamic interplay between sexual motivation, emotional regulation, and relational coping mechanisms.

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Figure 1 *Interaction between sex of participants and the total scores of Difficulties in Emotion Regulation Scale (DERS) when the target variable was the Hungarian version of Reasons for Having Sex Questionnaire (YSEX?-HSF) Personal Goal Attainment summary scale*

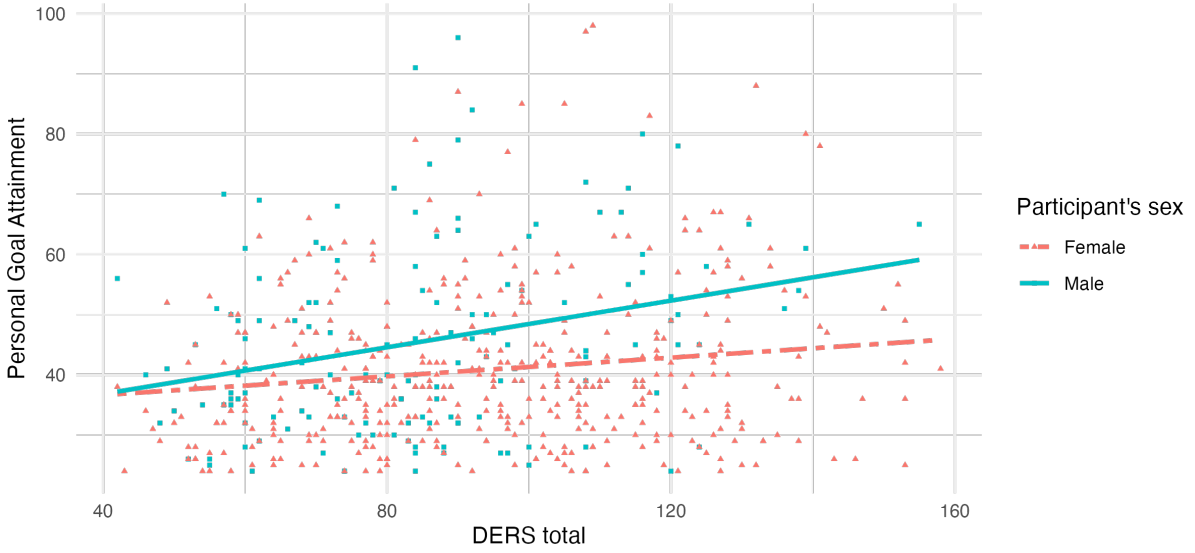


Figure 2 *Interaction between sex of participants and the scores of Difficulties in Emotion Regulation Scale Non-acceptance of emotional responses subscale (DERS Non-acceptance) when the target variable was the Hungarian version of Reasons for Having Sex Questionnaire (YSEX?-HSF) Personal Goal Attainment summary scale*

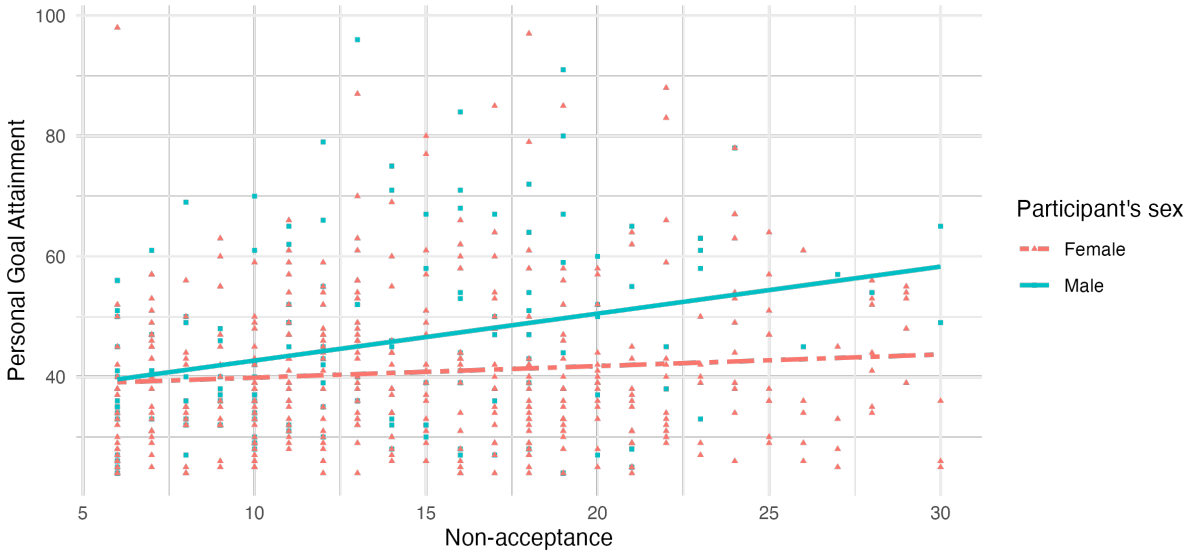


Figure 3 *Interaction between sex of participants and the scores of Difficulties in Emotion Regulation Scale Impulse control difficulties subscale (DERS Impulse) when the target variable was the Hungarian version of Reasons for Having Sex Questionnaire (YSEX?-HSF) Personal Goal Attainment summary scale*

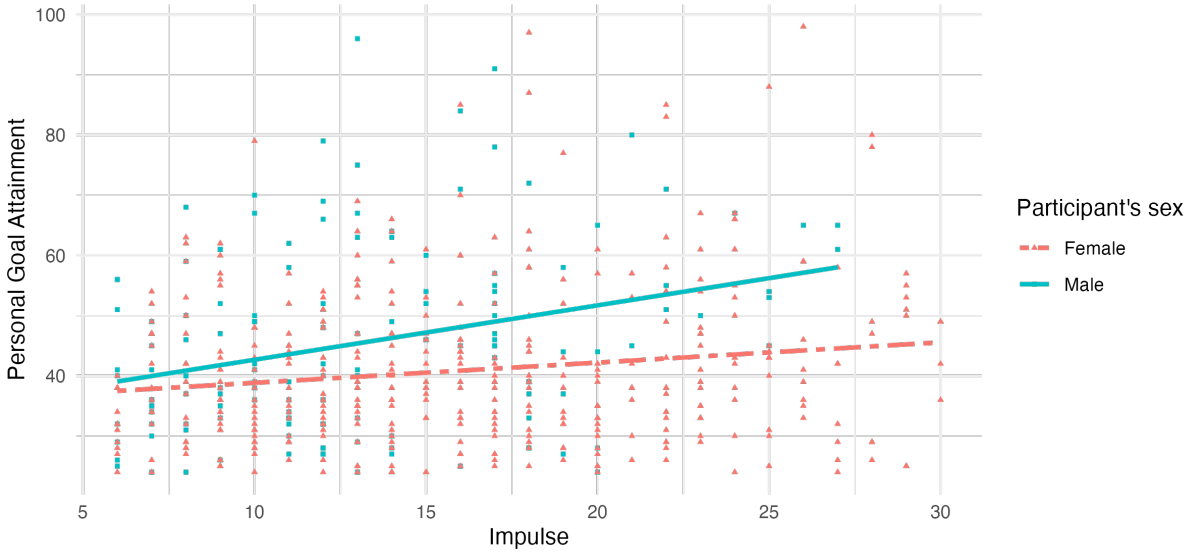


Figure 4 *Interaction between sex of participants and the scores of Difficulties in Emotion Regulation Scale Limited access to emotional regulation strategies subscale (DERS Strategies) when the target variable was the Hungarian version of Reasons for Having Sex Questionnaire (YSEX?-HSF) Personal Goal Attainment summary scale*

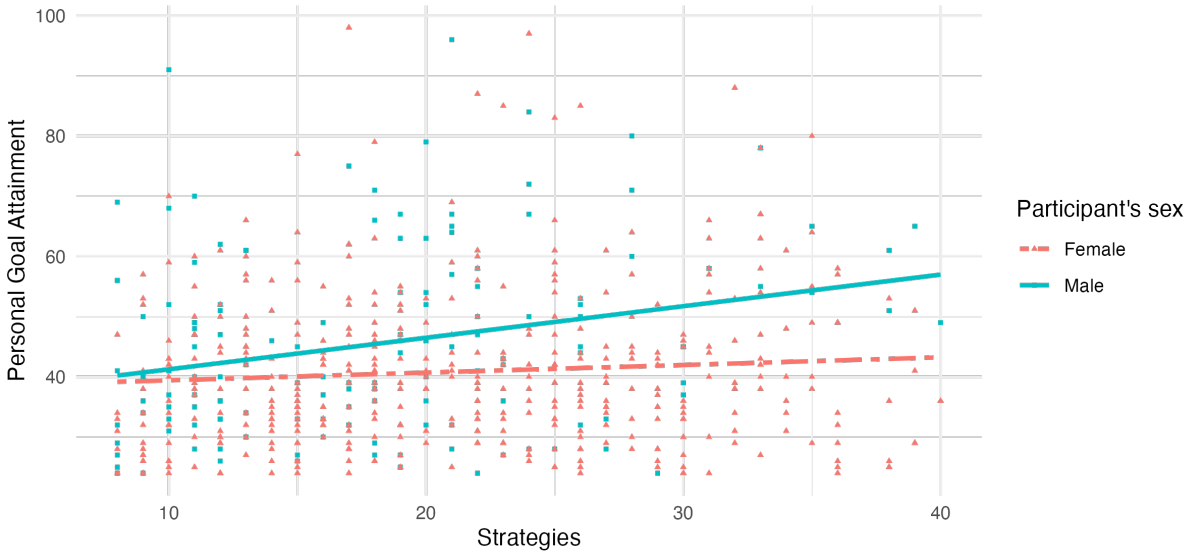


Figure 5 *Interaction between sex of participants and the scores of Difficulties in Emotion Regulation Scale Lack of emotional awareness subscale (DERS Awareness) when the target variable was the Hungarian version of Reasons for Having Sex Questionnaire (YSEX?-HSF) Sex as Coping summary scale*

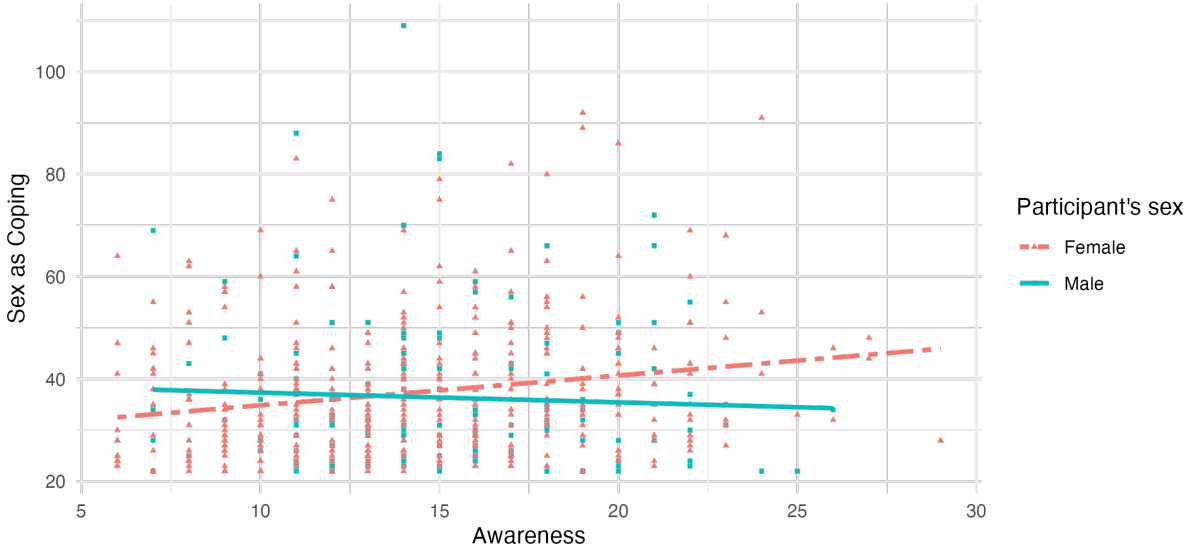


Figure 6 *Interaction between sex of participants and the scores of Difficulties in Emotion Regulation Scale* Non-acceptance of emotional responses *subscale (DERS Non-acceptance) when the target variable was the Hungarian version of Reasons for Having Sex Questionnaire (YSEX?-HSF) Sex as Coping summary scale*

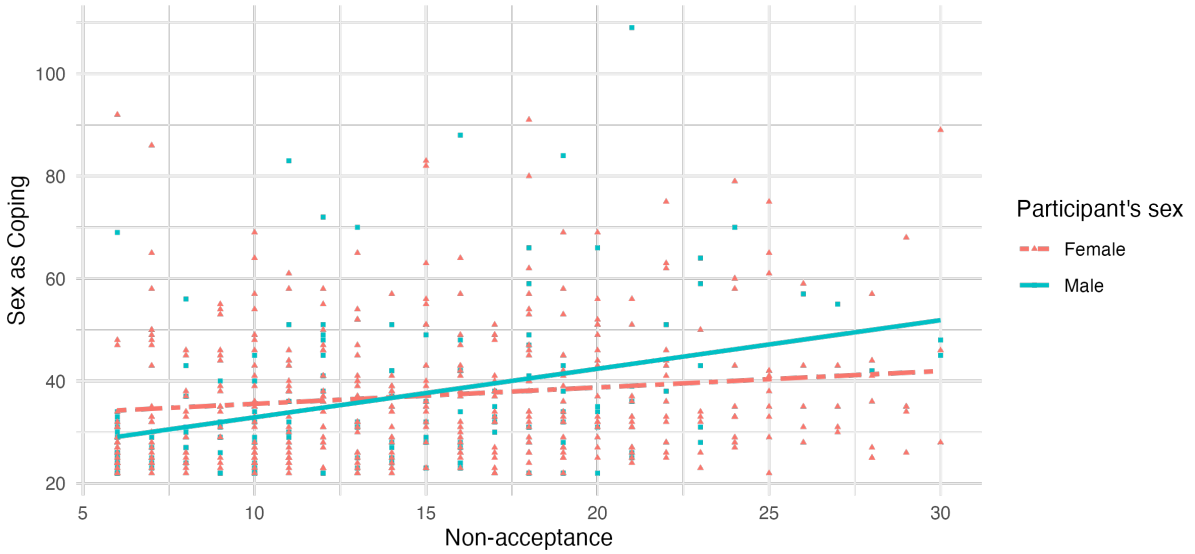


Figure 7 *Interaction between sex of participants and the scores of Difficulties in Emotion Regulation Scale Limited access to emotional regulation strategies subscale (DERS Strategies) when the target variable was the Hungarian version of Reasons for Having Sex Questionnaire (YSEX?-HSF) Sex as Coping summary scale*

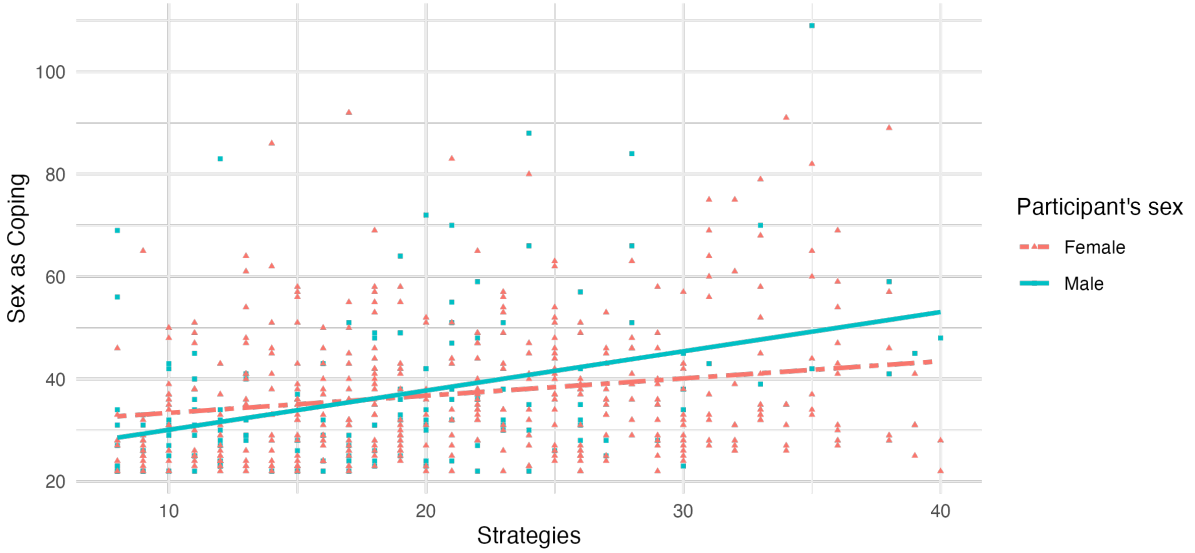


Figure 8 *Interaction between sex of participants and the scores of Difficulties in Emotion Regulation Scale Impulse control difficulties subscale (DERS Impulse) when the target variable was the Hungarian version of Reasons for Having Sex Questionnaire (YSEX?-HSF) Sex as Coping summary scale*

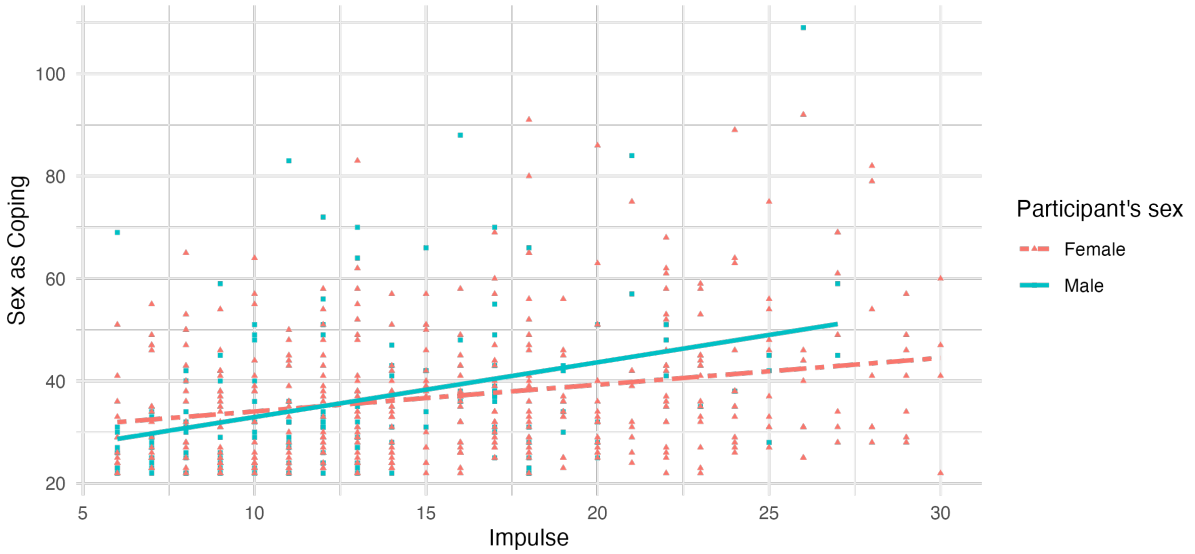


Figure 9 *Interaction between sex of participants and the total scores of Dyadic Coping Inventory (DCI) when the target variable was the Hungarian version of Reasons for Having Sex Questionnaire (YSEX?-HSF) Personal Goal Attainment summary scale*

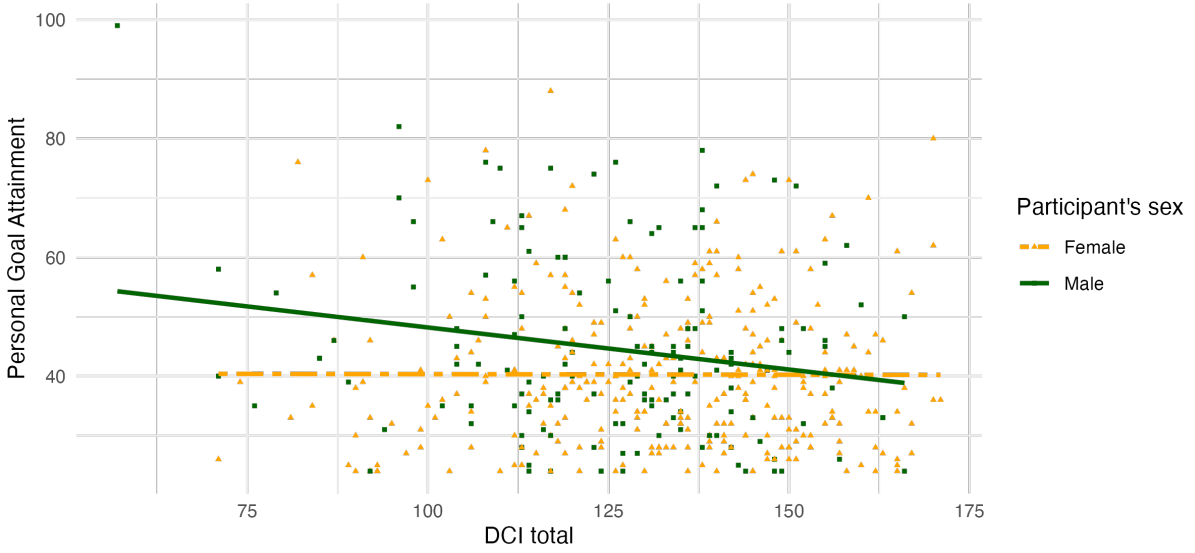


Figure 10 *Interaction between sex of participants and the scores of Difficulties in Dyadic Coping Inventory One's Own Dyadic Coping subscale (DCI DCO) when the target variable was the Hungarian version of Reasons for Having Sex Questionnaire (YSEX?-HSF) Personal Goal Attainment summary scale*

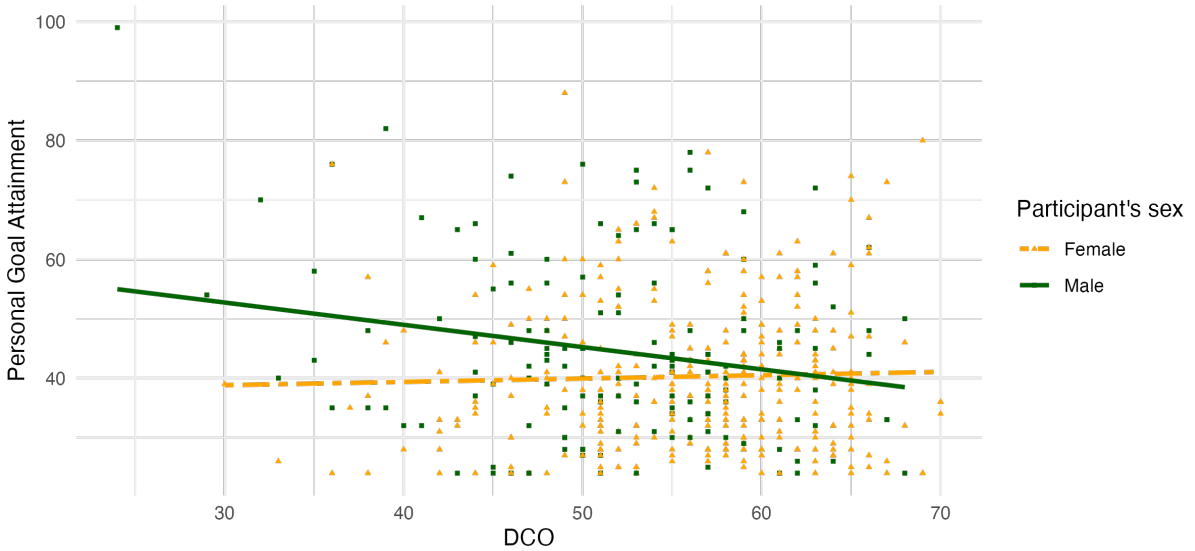


Figure 11 *Interaction between sex of participants and the scores of Difficulties in Dyadic Coping Inventory Partner's Dyadic Coping subscale (DCI DCP) when the target variable was the Hungarian version of Reasons for Having Sex Questionnaire (YSEX?-HSF) Personal Goal Attainment summary scale*

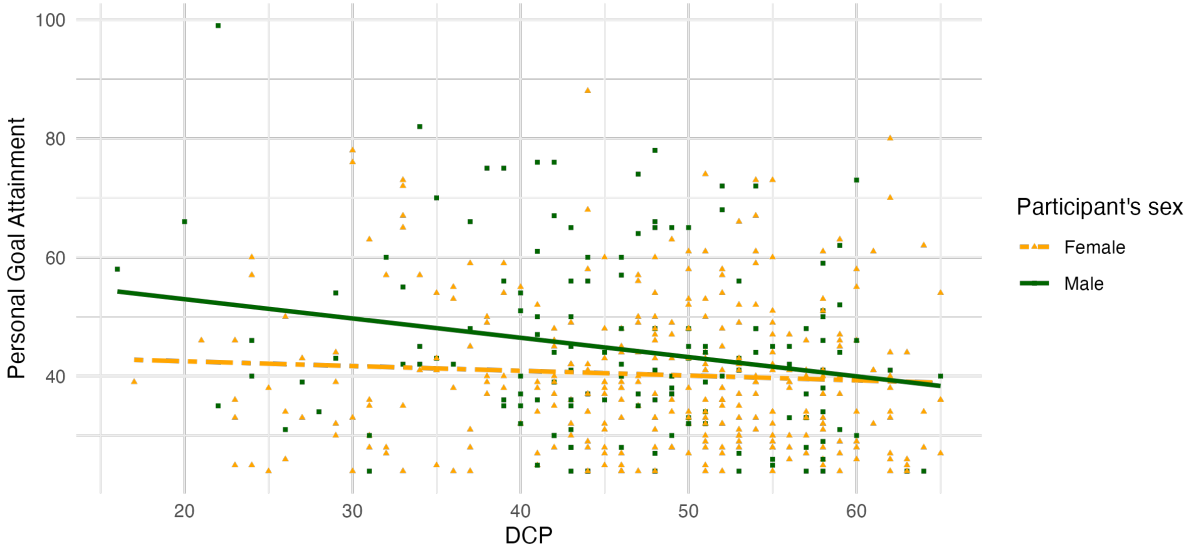


Figure 12 *Interaction between sex of participants and the scores of Difficulties in Dyadic Coping Inventory Positive Dyadic Coping subscale (DCI PDC) when the target variable was the Hungarian version of Reasons for Having Sex Questionnaire (YSEX?-HSF) Personal Goal Attainment summary scale*

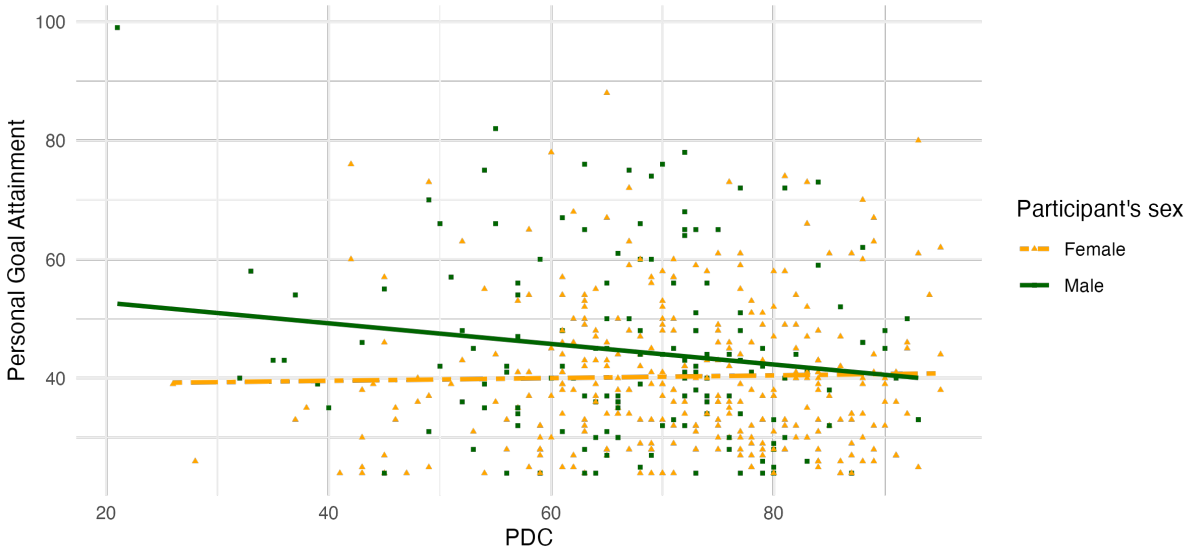


Table 1 *Demographics of the samples*

	Study 1	**Study 2**
N	572	466
Woman/man, n (%)	425/147 (74/26%)	319/147(68.6/31.4%)
Age (women) M (SD)	24.51 (7.74)	28.9 (9.5)
Age (men) M (SD)	29.14 (10.04)	33.6 (12.9)
Tertiary	227 (39.9%)	293 (63%)
Secondary	328 (57.3%)	165 (35.3%)
Primary	17 (3%)	8 (1.7%)
Single	109 (19.12%)	22 (4.73%)
Casual sexual encounters	35 (6.12%)	12 (2.36%)
Committed (but not cohabiting) relationships	217 (37.93%)	162 (34.84%)
Cohabited with the partner	156 (27.27%)	151 (32.47%)
Married	47 (8.21%)	119 (25.59%)
Other forms of relationships	6 (1.40%)	–

Table 2 *P-values of fixed effects of variables and interactions included in the GLM Models focusing on Difficulties in Emotion Regulation Scale (DERS) factors to estimate predictors of the Hungarian version of Reasons for Having Sex Questionnaire (YSEX?-HSF) factor scores*

Target variable	Factor	Akaike Corrected IC	Fixed effects (*p*-values)[a]				
			Corrected model	Age[b]	Sex[b]	Sex x factor[b]	*Factor* effect
YSEX?-HSF Personal Goal Attainment	DERS Total score	4517.015	**<.001**	*.981*	*.374*	**.037**	**<.001**
	Non-Acceptance	4516.171	**<.001**	*.546*	*.414*	**.009**	**<.001**
	Goals	4528.409	**<.001**	*.664*	.615	.335	**.016**
	Impulse	4508.176	**<.001**	*.939*	*.612*	**.019**	**<.001**
	Awareness	4530.098	**.002**	*.696*	.282	*.879*	.154
	Strategies	4521.609	**<.001**	*.860*	*.552*	**.020**	**<.001**
	Clarity	4507.901	**<.001**	*.954*	.278	*.870*	**<.001**
YSEX?-HSF Relational Reasons	DERS Total score	4507.901	**<.001**	***.001***	*.717*	.932	.137
	Non-Acceptance	4981.859	**<.001**	***<.001***	*.378*	.569	**<.001**
	Goals	4993.897	**<.001**	***<.001***	*.871*	*.564*	.293
	Impulse	4989.950	**<.001**	***.001***	*.119*	.185	**.009**
	Awareness	4973.851	**<.001**	***<.001***	.416	*.306*	**<.001**
	Strategies	4993.117	**<.001**	***.001***	*.732*	*.970*	.060
	Clarity	4993.545	**<.001**	***.001***	.726	*.509*	.594
YSEX?-HSF Sex as Coping	DERS Total score	4493.185	**<.001**	.258	*.086*	.063	**<.001**
	Non-Acceptance	4510.826	**<.001**	.906	***.009***	**.005**	**<.001**
	Goals	4528.573	**.008**	.687	*.208*	.194	**<.001**
	Impulse	4493.482	**<.001**	.368	*.052*	**.021**	**<.001**
	Awareness	4523.761	**<.001**	.433	**.034**	***.011***	.191
	Strategies	4498.738	**<.001**	.314	***.019***	**.008**	**<.001**
	Clarity	4480.108	**<.001**	.300	.906	*.898*	**<.001**

Note: Non-acceptance = Non-acceptance of emotional responses; Goals = Difficulties engaging in goal-directed behavior; Impulse = Behavioral impulse control and regulation difficulties; Awareness = Lack of emotional awareness; Strategies = Limited access to emotional regulation strategies; Clarity = Lack of emotional clarity.
[a]Bold figures indicate significance on a $p < .05$ level.
[b]Figures in italics indicate that the fixed coefficient is negative.

Table 3 *P-values of fixed effects of variables and interactions included in the GLM Models focusing on Dyadic Coping Inventory (DCI) factors to estimate predictors of Hungarian version of Reasons for Having Sex Questionnaire (YSEX?-HSF) factor scores*

Target variable	Factor	Akaike Corrected IC	Fixed effects (*p*-values)[a]				
			Corrected model	Age[b]	Sex[b]	Sex x factor[b]	*Factor* effect
YSEX?-HSF Personal Goal Attainment	DCI Total score	3733.751	**.002**	.584	**.011**	***.033***	**.040**
	DCO	3726.941	**<.001**	.482	**.001**	***.004***	.058
	DCP	3730.274	**<.001**	.660	**.018**	*.070*	**.010**
	NDC	3719.486	**.001**	.410	.675	.513	**.010**
	PDC	3734.202	**.004**	.508	**.015**	*.054*	.180
YSEX?-HSF Relational Reasons	DCI Total score	4083.032	**<.001**	.612	.721	.988	**<.001**
	DCO	4070.790	**<.001**	.796	.121	*.266*	**<.001**
	DCP	4101.889	**.015**	*.962*	.953	.760	**.004**
	NDC	4089.570	.341	.373	.215	.545	.940
	PDC	4074.355	**<.001**	.569	.569	*.711*	**<.001**
YSEX?-HSF Sex as Coping	DCI Total score	3599.228	.534	.857	*.277*	*.312*	.373
	DCO	3598.148	.964	.683	*.569*	.611	.989
	DCP	3591.944	.094	*.942*	*.392*	.438	**.035**
	NDC	3580.039	.092	.819	.662	.723	**.007**
	PDC	3599.245	.845	.681	*.292*	.326	.996

Note: DCO = One's Own Dyadic Coping, DCP = Partner's Dyadic Coping, NDC = Negative Dyadic Coping, PDC = Positive Dyadic Coping.

[a] Bold figures indicate significance on a $p < .05$ level.

[b] Figures in italics indicate that the fixed coefficient is negative.

2.7 A Cross-cultural Examination of Intrasexual Competition: The Links Between Mating Competition, Aggression, Appearance Enhancement, and Sexuality[7]

Norbert Meskó[1]*, Adam C. Davis[3], Steven Arnocky[2], Fanni Őry[1], Katalin O. Burghardt[1], Dóra E. Kiss[1], Kevin E. Tololiu[1], Tamás Bereczkei[1], Juneman Abraham[4], Hyemin Han[5]

[1]University of Pécs, Institute of Psychology, Pécs, Hungary

[2]Nipissing University, Department of Psychology, North Bay, Canada

[3]Canadore College, Department of Social Sciences, North Bay, Ontario, Canada

[4]Bina Nusantara University, Department of Psychology, Jakarta, Indonesia

[5]Educational Psychology Program, University of Alabama, Tuscaloosa, USA

*Corresponding author

Abstract

In the context of mating, individuals of the same sex often act as rivals in the pursuit, attraction, and retention of desirable partners. This study explored the relationships between intrasexual competition with various aspects of human mating psychology across three cultures: Canada, Hungary, and Indonesia. A total of 661 participants (497 women, 132 men) completed an online questionnaire including self-report measures for sensation seeking, aggression, beauty-enhancing behavior, openness to cosmetic surgery, sexual motivation, and sociosexuality. Hypotheses were tested via Bayesian multilevel modeling. A measurement invariance test and measurement alignment were performed to address potential issues with non-invariance in measures across different groups. Results indicated positive correlations between each psychological variable examined and intrasexual mating competition. The results for openness to cosmetic surgery, sociosexuality and aggression confirm findings from previous research, whereas the associations between sensation seeking, aesthetic enhancement behavior, and sexual motivation are novel. The analysis of intrasexual mating competition by country shows that Canadian scores were significantly lower than Indonesian and Hungarian scores, whereas the latter two were not significantly different from each other.

Keywords: intrasexual mating competition, cross-cultural analysis, sensation seeking, aggressiveness, beauty enhancement, sexuality

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Theoretical background

Intrasexual competition

From an evolutionary standpoint, intrasexual competition is the manifestation of competitiveness with members of the same sex to improve access to and the retention of mates [1,2,3,4]. During heterosexual mate selection, the preferences of one sex serve as a reference point for another sex to align with [3,5,6,7]. This implies that in competition for mating, individuals of the same sex must consider each other as factors influencing survival and reproductive success due to their competition for similar resources [7,8]. Two primary strategies within intrasexual competition have been described: self-promotion and competitor derogation [9,10,10,11,12,13,14,15]. Self-promotion involves emphasizing qualities to enhance one's attractiveness to potential partners, whereas derogating rivals entails efforts to decrease the mate value of competitors. These strategies often persist even after mate selection to maintain the relationship. In long-term partnerships, for example, women frequently utilize both "enhancing one's own appeal" and "derogating rivals" to sustain the mateship.

Evolutionary theories suggest that individuals who engage more intensely in intrasexual competition may exhibit behaviors and tendencies aimed at maximizing their reproductive success, including sensation seeking, aggression, beauty enhancement, openness to cosmetic surgery, unrestricted sociosexuality, and heightened sexual motivation. The next section introduces the psychological constructs that were analyzed in this study and their association with intrasexual competition. The final section focuses on the particularities of intrasexual competition across cultures.

Sensation Seeking

Sensation seeking is a personality trait associated with certain behaviors, attitudes, and preferences, and explained by complex (genetic, biological, psychophysiological, and societal) factors [16]. In the context of intrasexual competition, sensation seeking serves as an adaptive strategy. The pursuit of novel, intense experiences increase an individual’s visibility and appeal to potential mates, thus providing a competitive edge in the mating market [17,18]. High sensation seeking can facilitate intrasexual rivalry by enhancing one's attractiveness through displays of boldness and vitality [19].

Positive associations have been found between sensation seeking and risky sexual behavior [20], preferences for novel sexual experiences [21], and extradyadic sexual behavior [22]. For instance, Seto and colleagues [23] found that men’s sensation seeking positively correlated with total number of sexual partners, average number of partners in sexually active years,

shorter time from meeting to sex, proportion of short-term past relationships, number of desired partners in the next year, and diversity of sexual activities participants had experienced or wished to experience They also found a negative link with age at first intercourse, indicating a short-term mating strategy.

Aggression

Aggression can function as a strategy to outcompete rivals, either by intimidating them or by directly reducing their access to resources and potential mates [24]. Indeed, aggression and physical dominance are critical in defending and acquiring resources necessary for survival and reproduction [11]. Traditionally men have been considered the more intrasexually competitive and physically aggressive sex. Although, research in recent decades has shown that women evidently engage aggressive behavior throughout the world, ranging from verbal insults to homicide [25,26,27,28,29]. Burbank's [30] cross-cultural examination supports that women employ physical aggression in intrasexual competition, particularly in societies with polygyny. Female aggression is primarily directed towards same sex rivals and generally results in minimal injury. The most common victims are co-wives and other sexual and marital rivals, with competition revolving around food, money, paternal care for offspring, and inheritance for their own descendants.

Beauty Enhancement

Investment in beauty-enhancing practices, such as the use of makeup, fashion, and even cosmetic surgery, is a strategic effort to improve one's competitive standing in the mating market [7]. Those deeply engaged in intrasexual competition are thus inherently more driven to enhance their physical appearance [4,5,31,32].

Women engaging in intrasexual competition often employ beauty-enhancing behavior [33]. As female reproductive value is reliably signaled by physical indicators related to health and fertility, men’s attractiveness assessment mechanisms have been shaped by selection to focus on physical appearance [7,10,31]. In line with this reasoning, women's relatively young age holds a prominent position in men's long-term mating preferences since youth correlates with greater health and fertility [34,35,36]. Enhancing physical attractiveness has historically been an effective way for women to compete for higher quality mates by gaining an edge over their rivals to increase the chances of finding an ideal romantic partner [37]. Nonetheless, men evidently engage in visual appearance enhancement behavior to attract and retain mates, as well as to intimidate rivals (e.g., weightlifting, cosmetic surgery, depilation) [5]. Thus, beauty-enhancing behavior [38], or beautification [39] can be used by any sex to augment attractiveness;

however, investment in physical attractiveness is a more salient intrasexual competition tactic for women [40].

Cosmetic Procedures

The willingness to undergo cosmetic surgery is a more extreme manifestation of beauty enhancement within the context of intrasexual competition [41]. Individuals who perceive themselves to be in a highly competitive environment are more likely to pursue such interventions, which do appear to provide a reproductive advantage [42]. For instance, women undergoing microfat transfer surgery effectively reduce their waist-to-hip ratio, leading to a perceived increase in physical attractiveness [43]. Similarly, rhinoplasty has been shown to enhance physical attractiveness, contributing to more favorable evaluations of an individual's personality [44]. Women who undergo breast augmentation surgery also report being more attractive to those around them than before the procedure [45].

Highly competitive women exhibit a more positive attitude towards cosmetic surgery compared to those less inclined toward competition [46]. Garza and Pazhoohi [47] found that women with higher levels of intrasexual competition were more likely to enhance their physical appearance when exposed to images of potential competitors with attractive features.

Cosmetic surgeries enhance cues to youthfulness and fertility, which increases women's attractiveness, and produces important consequences concerning mate selection and intrasexual competition [47,48,49,50]. Recent studies supporting this connection indicate that even contemplating cosmetic surgery regulates women's mate preferences and mate-retention [41,48,51]. Bradshaw et al. [51] found that women with heightened short-term mating effort were more accepting of costly appearance-enhancing techniques (e.g., cosmetic surgery) but not lower-cost appearance enhancements (e.g., facial cosmetics). Furthermore, both male and female participants inferred that an individual's cosmetic surgical interventions served as a means for increasing short-term mating effort.

Sexual Motivation

The drive for sex is amplified in individuals who are actively competing for mates, as sexual success is the ultimate currency in the evolutionary race for reproductive success [52]. Sexual motivation involves an intricate interplay of the brain's reward system, hormonal fluctuations, and psychological factors that drive individuals toward seeking sexual pleasure, intimacy, and reproduction [53,54,55,56,57,58,59].

Limited research has explored the connection between sexual motivation and intrasexual competition, and these studies have mainly revealed indirect findings, especially among men. Bleske-Rechek and Buss [10] found that men's behavior related to mating efforts (e.g., frequent

propositions and sex), correlated with how they perceived the effectiveness of masculine behavior, belittling a rival's dominance and attractiveness, and challenging the dominance of competitors. In other words, men with higher mating effort employed relatively more intrasexual competition tactics. Mating effort can be directed toward short-term mating, including a greater intention to engage in sexual relationships with different partners, as well as long-term mating, such as a greater use of mate retention tactics [60]. In a study by Massar and Buunk [61], male participants subliminally primed with sexual or commitment-related words were subsequently exposed to a romantic rival. They found that sexual desire modulated men's propensity for intrasexual competition: those with higher sexual desire felt more threatened by rivals in the sexual context, whereas men with lower sexual desire felt more threatened in the commitment context. Despite sparse research evidence, it can be generally inferred that individuals participating in intrasexual competition for high-quality mating partners are likely those with higher sexual arousal, indicating higher sexual motivation, compared to those uninterested in competing for partners [62].

Sociosexuality

The combination of traits promoting short-term mating, including an unrestricted sociosexual orientation (i.e., a greater desire to have sex outside of committed relationships), encourages the use of riskier and antagonistic intrasexual competitive tactics. For instance, Simpson et al. [63] had participants compete with a same-gender individual for a lunch date with an attractive opposite gender other. They found that men with a short-term mating orientation (unrestricted sociosexuality) reported more direct intrasexual competition tactics (e.g., asserting superiority) than men with a long-term mating orientation (restricted sociosexuality) who resorted more to self-promotion strategies (e.g., using humor). Davis et al. [64] found that unrestricted sociosexuality, particularly the desire aspect, positively predicted same-sex indirect aggression, and that intrasexual competitiveness positively mediated this link in Canadian adults. Thus, individuals with a short-term mating orientation, especially those with unrestricted desires, engage in more indirect aggression towards same-sex peers, and this relation is partly explained by their tendency to be competitive with same-sex rivals for social and mating resources.

Under certain circumstances, intrasexual competition and unrestricted sociosexuality might enhance individual reproductive success, but these riskier strategies can contribute to poorer well-being. In a Brazilian study [65] of heterosexual women, it was found that higher well-being negatively predicted intrasexual competition and sociosexuality. Unrestricted sociosexuality and intrasexual competition have also been positively linked to distress over not

participating in salient social events and activities, referred to as fear of missing out (FoMO), in Canadian adults [66]. Taken together, these results suggest that unrestricted sociosexual orientation may be related to heightened intrasexual competition.

Cultural Differences in Intrasexual Competitiveness

Although multiple studies on intrasexual competition have been carried out across various countries, such as Argentina [67], Chile [68,69,70], Switzerland [71], Brazil [65], the Netherlands [61], Uruguay [72], and Canada [73,74], few have explicitly aimed at a comparative analysis of intrasexual competition between varying nations. Buunk and Fisher [74] developed the Intrasexual Competition Scale (ICS) and conducted a comparative analysis on samples of university students from Holland and Canada. They found that the ICS was suitable for measuring individual differences in intrasexual competitiveness in both countries: it was gender-neutral, reliable, and showed a high degree of equivalence between nations. However, correlations with sociosexuality varied between countries. In the Netherlands, sociosexuality, sexual desire, and social comparison orientation were positively related to intrasexual competition, but the effects were modest. In Canada, there was no association between sociosexuality and intrasexual competition, suggesting a lack of robust relationship between the two variables.

Buunk et al. [72] analyzed the relationships between intrasexual competition and the Big Five personality traits in Uruguay. Among men, neuroticism and extraversion positively predicted intrasexual competition. For women, besides neuroticism, lack of agreeableness was an important predictor of intrasexual competition. The results obtained in Uruguay were even stronger than those in Canada, particularly among women, suggesting that these associations might be stable across cultures.

Buunk [73] recently examined how competitive attitudes toward one's own gender correlate with various cultural dimensions among 80 university students from 30 different European, Asian, and African countries (all students at a Dutch university). Multiple regression analysis revealed that vertical individualism positively and horizontal collectivism negatively predicted intrasexual competition. That is, individuals from cultures accepting inequality and status differences were more likely to exhibit higher competitiveness, whereas those from cultures emphasizing similarity among their members were less likely. Moreover, higher intrasexual competition was typically characteristic of cultures with low gender equality.

Jonason et al. [75] analyzed data from 3707 respondents from 42 countries, examining intrasexual competition in Western, educated, industrialized, rich, and democratic (WEIRD) versus non-WEIRD countries. They proposed and employed a new theoretical model for intrasexual competition encompassing three components: envy, jealousy, and competitiveness.

Those in WEIRD countries scored higher in envy than those in non-WEIRD countries, whereas jealousy scores were higher in non-WEIRD countries compared to WEIRD countries. No across-cultural differences emerged for competitiveness. Further analysis revealed that men scored higher in intrasexual competition in WEIRD versus non-WEIRD countries. Women showed the opposite trend, scoring higher in intrasexual competition in non-WEIRD versus WEIRD countries.

Present Study

Research indicates that the degree of intrasexual competition may vary across countries alongside different cultural dimensions. However, there is limited cross-cultural work on intrasexual competition, and it is unclear whether the links between intrasexual competitiveness with various facets of human mating, such as sociosexuality and aggression, vary between countries. Moreover, the general relations between intrasexual competition with sensation seeking, appearance enhancement, and sexual motives are unclear. The current study involves three countries (Canada, Hungary, Indonesia) that are geographically and culturally distinct. Canada, located in North America, embraces an individualistic value system and aligns more with WEIRD cultures. Indonesia, situated in Southeast Asia, predominantly holds a collectivistic value system and is categorized among non-WEIRD cultures. Hungary, located in Central Europe, falls between the other two in terms of geography but culturally might be closer to Canada due to its individualistic values.

Aims of the study, Hypotheses

Hypothesis 1 | Intrasexual competition will correlate positively with sensation seeking.

Hypothesis 2 | Intrasexual competition will correlate positively with aggression.

Hypothesis 3 | Intrasexual competition will correlate positively with all facets of acceptance of cosmetic surgery.

Hypothesis 4 | Intrasexual competition will correlate positively with beauty enhancing behavior.

Hypothesis 5.1 | Personal goal attainment sexual motives will correlate positively with intrasexual competition.

Hypothesis 5.2 | Relational reasons sexual motives will correlate positively with intrasexual competition.

Hypothesis 5.3 | Sex as coping sexual motives will correlate positively with intrasexual competition.

Hypothesis 6 | Intrasexual competition will positively correlate with unrestricted sociosexual desires, attitudes, and behavior.

Hypothesis 7 | It is expected that intrasexual competition will be more pronounced in the collectivistic/tight countries than in the individualistic/loose countries. Thus, intrasexual competition will be the highest in Canada, followed by Hungary, then Indonesia.

Method

Participants and Procedure

Overall, 661 participants completed the online survey from the three participating countries: 124 individuals from Canada, 272 from Hungary, and 96 from Indonesia. To increase the number and diversity of respondents, the survey link was also sent to students attending the international BA Psychology program at the University of Pécs, which added another 169 respondents from different countries, such as Australia (1), Bangladesh (2), and India (4), but most did not specify their country (151).

The final sample included 497 (75.2%) women, 132 (20.0%) men, 29 (4.4%) non-binary individuals, and 3 (.5%) who chose "prefer not to say". Regarding sex at birth, 523 (79.1%) were women, 137 (20.7%) were men, and 1 (.2%) individual was intersex. The participants were aged 18 to 67 years (M = 27.3, SD = 10.05, Mdn = 23). Regarding intimate partner relationship, 240 (36.3%) participants were single (not dating anyone), 53 (8.0%) were single (not in a long-term relationship, occasional sexual encounters), 144 (21.8%) were in a committed relationship but not living together, 97 (14.7%) were living together with a partner but not in marriage or official cohabited relationship, 108 (16.3%) were living with a partner in marriage or official cohabited relationship, and 19 (2.9%) answered "other" and named different partnered situations (e.g., "polyamorous", "widow").

Hungarian participants completed the survey in their own language, whereas everyone else completed the survey in English. All the scales used in the survey had a previously published Hungarian version except for the ICS. A preliminary step was to translate the questions and instructions of the ICS into Hungarian by the authors. The accuracy of the Hungarian version was confirmed using the standard back-translation technique [76,77,78], where an independent translator, not associated with the study translated the questions and instructions back into English. Any discrepancies that arose during the back-translation were resolved through collaboration between the two translators. Online data was collected between May and November 2023 using the cloud-based surveying platform Qualtrics. Originally, the intention was to send the research link to a sample of university students, however, as the target of around 200

participants per country was not achieved, data collection was expanded to include social media platforms where participants were invited to share the link on their own social media networks.

The research plan was licensed by the Hungarian United Ethical Review Committee for Research in Psychology, under Reg. No. EPKEB 2023/52. The ethics committee fully complied with the relevant international ethical guidelines and regulations for research with human participants in accordance with the Declaration of Helsinki [79] and with the Ethical Principles of Psychologists and Code of Conduct published by the American Psychological Association [80]. Each collaborator fully observed the ethical guidelines adopted by the Institutional Review Board (that of the Principal Investigator's or their own institution). All participants gave informed consent to participation in the survey.

Transparency and Openness

The determination of sample size, data exclusions, manipulations, and all procedures in the study, were reported in accordance with the Journal Article Reporting Standards (JARS) [81]. All collected data that support the findings of this study, and R codes for analysis can be found on the Open Science Framework project website: https://osf.io/7a6qr/?view_only=be4c9ef8d3744cfd951ded2205025f88

Data was analyzed using *R*, version 4.0.0 [82]. This study's design and its analysis were not pre-registered.

Measures

Intrasexual Competition Scale (ICS)

The ICS [74] is a 12-item self-report instrument designed for measuring individual differences in intrasexual competitiveness. A recent analysis Albert et al. [83] explored two subscales, namely Superiority Enjoyment and Inferiority Frustration, that identify distinct dimensions of intrasexual competition. (As one anonymous reviewer suggested we consider a one-factor model instead of the two-factor model, we performed CFA to examine which model is superior to the other. The CFA result confirmed that the two-factor model, RMSEA = .053, SRMR = .068, CFI = .976, was better than the one-factor model, RMSEA = .087, SRMR = .091, CFI = .934. The subsequent χ^2 test also supported that, χ^2 (4) = 176.15, $p < .001$. Given the result, we decided to continue to use the two-factor. The items of the Superiority Enjoyment subscale reflect the pursuit of social superiority over same-sex rivals (e.g., "I want to be just a little better than other men/women."). Items in the Inferiority Frustration subscale capture a sense of frustration arising from encounters with same-sex rivals whom the person perceives as a more desirable mate (e.g., "I wouldn't hire a very attractive man/woman as a colleague." Or "I just don't like very ambitious men/women."). Each item was rated on a seven-point scale

ranging from “Not typical at all” (1) to “Very typical” (7). Higher scores, computed by averaging the items, indicated higher levels of intrasexual competition on both subscales.

Brief Sensation Seeking Scale (BSSS-8)

The BSSS-8 [84] is an 8-item self-report instrument designed to measure individual differences in sensation seeking. The Hungarian version developed by Mayer et al. [85]. The scale includes four subscales: Experience seeking, Boredom susceptibility, Thrill and Adventure Seeking, and Disinhibition. In our current research, we used this instrument as a single composite scale (e.g., “I would love to have new and exciting experiences, even if they are illegal.”). Each item was rated on a five-point scale ranging from “Strongly disagree” (1) to “Strongly agree” (5). Items were averaged to calculate a BSSS-8 total score, with higher scores describing greater levels of sensation seeking.

Buss–Perry Aggression Questionnaire (BPAQ)

The BPAQ [86] is a 12-item self-report instrument which includes four subscales for measuring individual differences in aggressiveness. The Hungarian version developed by Gerevich et al. [87]. The inventory provides sum scores for subscales: Physical Aggression (e.g., “Given enough provocation, I may hit another person.”), Verbal Aggression (e.g., “I can’t help getting into arguments when people disagree with me.”), Anger (e.g., “I have trouble controlling my temper.”, and Hostility (e.g., “At times I feel I have gotten a raw deal out of life.”). Each item was rated on a four-point scale ranging from “Strongly disagree” (1) to “Strongly agree” (4). Higher summative scores denote higher levels of aggression.

Acceptance of Cosmetic Surgery Scale (ACSS)

The ACSS [88] is a 15-item self-report instrument designed to measure individual differences in openness to cosmetic procedures. The Hungarian version developed by Meskó & Láng, [89]. The scale includes three subscales: Intrapersonal (e.g., “It makes sense to have minor cosmetic surgery rather than spending years feeling bad about the way you look.”), Social motivations (e.g., “I would seriously consider having cosmetic surgery if my partner thought it was a good idea.”), and Consider (e.g., “In the future, I could end up having some kind of cosmetic surgery.”). Each item was rated on a seven-point scale ranging from “Strongly disagree” (1) to “Strongly agree” (7). Items were averaged and higher total scores on the scale indicate higher levels of openness to cosmetic surgery.

Beauty Enhancement Behavior Scale (BEBS)

The BEBS [38] is an 8-item self-report instrument designed to measure individual differences in non-cultural behaviors associated with enhancing beauty. The BEBS includes eight common categories of beauty-enhancing behaviors: (1) applying makeup, (2) body hygiene, (3)

using cosmetics, (4) exercising, (5) hair grooming, (6) clothing style, (7) following a specific diet, and (8) other (where participants could describe what other activities they perform). Participants were asked to specify both the occurrence and frequency of their engagement in a designated beauty-enhancing activity. Clear instructions were provided, emphasizing that participants should select the specified activity solely if their motivation was to enhance their appearance (excluding other reasons like health considerations). In each category, participants were instructed to quantify the time on a scale dedicated to performing the designated activity on a typical day. The BEBS has been developed in 43 languages, including English and Hungarian. Higher scores denote more time spent on improving personal attractiveness and greater beauty-enhancing behavior.

15-item version of the Reasons for Having Sex Questionnaire (YSEX?-15)

The YSEX?-15 [56] is a self-report instrument for measuring sexual motivation. Based on the original American YSEX? questionnaire [58], Meskó and colleagues [57] created the Hungarian version of the YSEX? questionnaire, which includes three subscales: Personal Goal Attainment (e.g., "I wanted to seek experience."), Relational Reasons (e.g., "I wanted to celebrate."), and Sex as Coping (e.g., "I wanted to retain the relationship."). Participants were requested to indicate how frequently each of the listed reasons led them to have sexual intercourse in the past. If someone had not yet had sex, they were asked to indicate the likelihood that each of the listed reasons would lead them to have sex. Each item was rated on a 5-point scale ranging from "None of my sexual experiences" (1) to "All of my sexual experiences" (5). Items were averaged with higher scores indicating higher sexual motivation.

Revised Sociosexual Orientation Inventory (SOI-R)

The SOI-R [90] is a 9-item self-report instrument including three subscales for measuring individual differences in sociosexuality (uncommitted sexuality): Behavior (e.g., "With how many different partners have you had sexual intercourse without having an interest in a long-term committed relationship with this person?"); Attitudes (e.g., "I can imagine myself being comfortable and enjoying «casual» sex with different partners."); and Desire (e.g., "In everyday life, how often do you have spontaneous fantasies about having sex with someone you have just met?"). The Hungarian version developed by Meskó et al. [91]. The participants rated each item on 9-point scales: "1 = 0, 2=1, 3=2, 4=3, 5=4, 6=5–6, 7=7–9, 8=10–19, 9=20 or more" for Sociosexual Behavior; "1 = Strongly disagree" to "9 = Strongly agree" for Sociosexual Attitudes, and "1 = Never, 2 = Very seldom, 3 = About once every two or three months, 4 = About once a month, 5 = About once every 2 weeks, 6 = About once a week, 7 = Several times per

week, 8 = Nearly every day, 9 = At least once a day" for Sociosexual Desire. Higher overall scores indicated a more unrestricted sociosexual orientation.

Analysis Plans

Measurement invariance test and measurement alignment

Because we intended to conduct cross-national examinations with data collected with survey forms translated into different languages, we assessed measurement invariance before testing our hypotheses [92]. A measurement invariance test is required to ensure that different versions of the same scale, different languages in the present study, measure the intended latent factor invariantly [93]. We examined whether all the employed scales were invariant across the English and Hungarian versions. In addition to these tests for cross-group validity check, we examined the internal consistency of each measure via Cronbach α.

Measurement invariance can be examined via multigroup confirmatory factor analysis (MG-CFA). We employed an R package, *lavaan*, for this test [94]. There are four different levels of invariance (configural, metric, scalar, and residual) in terms of the extent to which contrasts across groups are applied while testing a measurement model of interest [92]. Configural invariance, the most lenient invariance, only assumes that the measurement model is identical across different groups. Metric invariance additionally requires the equal factor loadings. For scalar invariance, the equal intercept requirement should be satisfied. Residual invariance, the strictest invariance, is established when the equal residuals are supported by data. To compare group means and conduct regression analysis or other types of inferences involving multiple groups, at the least, scalar invariance should be established as a necessary condition [95].

Whether each level of invariance was supported by data could be tested by examining model fit indicators, RMSEA, SRMR, and CFI. First, we examined whether configural invariance was supported by data by examining the model fit indicators after conducting MG-CFA. Following the general guidelines, we employed RMSEA and SRMR $< .80$ and CFI $\geq .90$ as criteria to determine whether those were deemed acceptable [95,96]. Metric, scalar, and residual invariances were tested by examining the extent to which the model fit indicators changed when additional constraints were added to the model while conducting MG-CFA [94]. We concluded that metric invariance was supported when ΔRMSEA $< +.015$, ΔSRMR $< +.030$, and ΔCFI $\geq -.010$. For scalar and residual invariances, we employed ΔRMSEA $< +.015$, ΔSRMR $< +.015$, and ΔCFI $\geq -.010$ as criteria. Because the responses to the items were anchored to an ordinal scale, we used WLSMV estimator to minimize any potential bias during MG-CFA [97].

If scalar invariance was not supported, we performed measurement alignment to address the non-invariance issue [93,98]. Measurement alignment is a method to adjust parameters,

such as factor loadings and intercepts, to enable between-group comparisons for instances of non-invariance. The alignment routine automatically adjusts model parameters so that the degree of existing non-invariance is minimized. The automated process continuously seeks adjusted parameters until the optimal invariance pattern is achieved.

We employed the measurement alignment method with R following Han [99] and we adjusted factor loadings and intercepts via the alignment routine implemented in an R library, *sirt* [100]. The alignment process was performed for each scale. Once the procedure was completed, we examined whether the alignment method was able to address the existing non-invariant issue successfully by checking several indicators. First, we investigated the resultant R^2 values, $R^2_{loadings}$, and $R^2_{intercepts}$ indicating the extent to which the non-invariance was absorbed via alignment in the cases of factor loadings and intercepts, respectively. When both exceeded 75%, we deemed that non-invariance in loadings and intercepts were successfully absorbed, so scalar invariance for comparison and inference was achieved [98]. Second, we analyzed whether 25% or less items showed significant non-invariance after alignment for both factor loadings and intercepts [93].

For hypothesis tests, latent factor scores were used [101]. In the cases of scales that successfully achieved scalar invariance during MG-CFA without alignment, latent factor scores were calculated with *lavPredict* function implemented in *lavaan*, which estimates latent factor scores with factor loadings and intercepts resulting from CFA. If measurement alignment was conducted, we calculated latent factor scores using the adjusted factor loadings and intercepts by language group [95]. We used an *R* function following Han [95] to calculate the scores.

One exception was the BEBS, which measured how long each participant spent in different type of beauty enhancing behaviors, concrete behavioral outcomes, instead of a latent psychological construct. Hence, we used the composite score instead of the latent factor score after conducting MG-CFA or measurement alignment.

Hypothesis Testing

Association testing For general association tests, H1-6, we conducted Bayesian model exploration to examine which model was the best among possible candidate models [102]. We employed a Bayesian approach in the present study because it enables direct testing of a hypothesis of interest instead of a null hypothesis and direct model comparison and exploration, which could not be done feasibly through conventional frequentist approach [103]. Furthermore, inflated false positives are not considered to be significant issues in Bayesian analysis even when correction methods are not applied, because it is based on statistical assumptions that are different from those for conventional frequentist analysis [104]. Because we intend to

test multiple hypotheses, this aspect of Bayesian analysis provided a unique benefit as we were concerned about the potential false positives.

Given data was collected across different countries, we examined whether the inclusion of random effects, random intercepts and slopes improved the model [99,102]. We employed multilevel modeling examining both fixed effects at the population level and random effects at the group level [105]. Multilevel modeling including fixed and random effects is the most preferred way for hypothesis testing with multiple groups [106].

Using multilevel modeling, for instance, in the case of H1, we compared these models:

M0 (null model): BSSS ~ 0 (intercept only)

M1 (fixed-effect model): BSSS ~ ICS.superiority

M2 (random intercept model): BSSS ~ ICS.superiority + (1|country)

M3 (random slope model): BSSS ~ ICS.superiority + (1+ ICS.superiority |country)

Model comparison was conducted by calculating and comparing model Bayes Factors (BFs) [107]. A BF indicates the extent to which one model is better compared to another model. For instance, BF_{10} indicates the degree to which M1 is better compared with M0. We calculated all model BFs, BF_{10}, BF_{20}, and BF_{30} for all hypotheses via Bayesian multilevel modeling implemented in brms package with the default prior distribution for model exploration, Cauchy (0, 1) [108, 109]. For decision making, we assumed that one specific model was significantly better than others when the responsive 2log(modelBF) ≥ 2. 2log(BF) ≥ 2 has been used as a criterion to determine whether evidence supported one hypothetical model than the other positively [110]. If the model BF comparing two specific models did not exceed the threshold, then we calculated Bayesian R^2 values to determine which model to be further examined [108]. To ensure successful model convergence, we only included data collected from countries where 30 or more participants completed the survey [111]. All variables were standardized to obtain standardized coefficients as indicators for effect sizes.

Once the best model was identified, we examined the BF of the predictor of interest, for instance, ICS superiority in the case of H1, was higher than the threshold, 2log(BF) ≥ 2. Similar to the case of model exploration, 2log(BF) ≥ 2 is used as a threshold to conclude whether evidence positively supports an alternative hypothesis versus a null hypothesis [110]. In this case, the alternative hypothesis of interest became whether the effect of the predictor was significantly higher (or lower) than zero.

Cross-national comparison of intrasexual competition. For testing H7, we compared the mean score between examined countries with the calculated latent factor scores [101]. If scalar invariance was established, we compared the group mean scores estimated from the resultant

MG-CFA model with *lavPredict* in *lavaan*. If scalar invariance was not supported, we used the group mean scores estimated via measurement alignment [93,95]. Like association tests, only data collected from countries where 30 or more participants completed the survey were examined to ensure convergence during model testing. We conducted *t*-tests to test group differences with the estimated group means and standard deviations. The resultant *p*-values were corrected for false discovery rates to minimize the possibility of Type I error.

Results

Measurement Invariance Test and Measurement Alignment

The results of internal consistency, measurement invariance, and measurement alignment tests are reported in Table 1. Both subscales for the ISC demonstrated good internal consistency. The Superiority and Inferiority subscales could not achieve scalar invariance. Thus, we performed measurement invariance. The measurement invariance successfully addressed the non-invariance found from MG-CFA.

Table 1 *Results from measurement invariance test and measurement alignment*

		MG-CFA						Measurement alignment			
	α	RMSEA	SRMR	CFI	ΔRMSEA	ΔSRMR	ΔCFI	$R^2_{loadings}$	$R^2_{intercepts}$	% of non-invariance loadings	% of non-invariance intercepts
Intrasexual Competition Scale											
Superiority Enjoyment	.81							99.72%	99.86%	0.00%	0.00%
Configural invariance		.041	.017	.997							
Metric invariance		.033	.026	.996	-.009	.009	.000				
Scalar invariance		.092	.049	.957	.060	.023	-.039				
Inferiority Frustration	.82							99.47%	99.59%	0.00%	0.00%
Configural invariance		.089	.073	.856							
Brief Sensation Seeking Scale	.79							99.39%	99.46%	0.00%	0.00%
Configural invariance		.099	.058	.883							
Buss-Perry Aggression Questionnaire											
Physical Aggression	.68							98.28%	99.58%	0.00%	0.00%
Configural invariance		.000	.000	1.000							
Metric invariance		.083	.037	.955	.083	.037	-.045				
Verbal Aggression	.57							96.29%	97.57%	0.00%	0.00%
Configural invariance		.000	.000	1.000							
Metric invariance		.150	.042	.924	.150	.042	-.076				
Anger	.64							98.70%	99.33%	0.00%	0.00%
Configural invariance		.000	.000	1.000							
Metric invariance		.074	.026	.985	.074	.026	-.015				
Hostility	.61							99.62%	99.41%	0.00%	0.00%
Configural invariance		.000	.000	1.000							

Metric invariance		.000	.013	1.000	.000	.013	.000				
Scalar invariance		.181	.075	.750	.181	.062	-.250				
Acceptance of Cosmetic Surgery Scale											
Interpersonal	.91							99.93%	99.84%	0.00%	0.00%
Configural invariance		.092	.019	.982							
Social	.88							99.30%	99.83%	0.00%	0.00%
Configural invariance		.126	.045	.923							
Consider	.92							99.72%	99.97%	0.00%	0.00%
Configural invariance		.109	.021	.982							
Reasons for Having Sex Questionnaire											
Personal Goal Attainment	.70							98.26%	99.73%	0.00%	0.00%
Configural invariance		.107	.113	.902							
Relational Reasons	.82							99.42%	99.49%	0.00%	0.00%
Configural invariance		.113	.042	.961							
Sex as Coping	.74							98.21%	99.57%	0.00%	0.00%
Configural invariance		.050	.032	.972							
Metric invariance		.069	.055	.925	.019	.023	-.047				
Revised Sociosexual Orientation Inventory											
Sociosexual Behavior	.83							98.87%	99.90%	0.00%	0.00%
Configural invariance		.000	.000	1.000							
Metric invariance		.163	.077	.900	.163	.077	-.100				
Sociosexual Attitude	.81							98.37%	99.90%	0.00%	0.00%
Configural invariance		.000	.000	1.000							
Metric invariance		.137	.031	.980	.137	.031	-.020				
Sociosexual Desire	.87							Not required.	Not required.	Not required.	Not required.
Configural invariance		.000	.000	1.000							
Metric invariance		.000	.006	1.000	.000	.006	.000				
Scalar invariance		**.000**	**.006**	**1.000**	**.000**	**.001**	**.000**				
Residual invariance		**.000**	**.029**	**1.000**	**.000**	**.023**	**.000**				

Note. When the minimum requirement for MG-CFA, scalar invariance, was achieved, the MG-CFA results were bolded.

The BSSS demonstrated acceptable internal consistency. Since even configural invariance was not supported, we performed measurement to correct for non-invariance.

In the BPAQ, all subscales showed acceptable internal consistency except for the Verbal Aggression subscale. Because all subscales did not demonstrate scalar invariance, we conducted measurement alignment, which successfully addressed the non-invariance issue in all subscales.

The ACSS demonstrated good internal consistency in all subscales. However, all subscales failed to achieve even configural invariance, so measurement alignment was performed to address the non-invariance issue.

The resultant α values suggested the YSEX?-15H possessed good internal consistency in all subscales. The results from measurement invariance tests indicated that measurement alignment was required. Measurement alignment addressed the problem.

For all subscales of the SOI-R, the internal consistency was good. When MG-CFA was performed, only the Sociosexual Desire subscale achieved the strictest invariance, residual invariance, which was more than the required minimum (scalar invariance). Thus, we conducted measurement alignment for two other subscales, the Sociosexual Behavior and Attitudes subscales. The alignment process addressed non-invariance for the two subscales.

Table 2 *Results from Bayesian model exploration*

	Hypothesis	Men			Women		
		$2\log(BF_{10})$	$2\log(BF_{20})$	$2\log(BF_{30})$	$2\log(BF_{10})$	$2\log(BF_{20})$	$2\log(BF_{30})$
H1	BSSS Sensation Seeking	-3.27	-4.49	-7.41	13.81	21.17	15.72
H2	BPAQ Physical Aggression	-1.83	4.30	-.51	-1.25	7.06	7.21
	BPAQ Verbal Aggression	1.59	5.28	2.75	35.45	45.25	41.74
	BPAQ Anger	-4.75	-7.71	-11.86	19.26	25.46	21.20
	BPAQ Hostility	-3.81	1.66	-2.37	22.63	35.88	35.52
H3	ACSS Intrapersonal	-.05	-3.04	-7.83	15.10	11.08	8.01
	ACSS Social	4.24	3.70	-.47	21.48	16.20	13.34
	ACSS Consider	.57	-1.93	-6.82	8.49	16.88	12.22
H4	BEBS Beauty Enhancement	-4.62	-9.34	-13.48	-5.16	60.21	57.59
H5	YSEX?-15 Goal Attainment— ICS Superiority	-4.65	-6.69	-9.48	19.88	42.68	39.08
	YSEX?-15 Goal Attainment—ICS Inferiority	-3.60	-5.16	-9.21	9.73	32.36	36.07
	YSEX?-15 Relational Reasons—Superiority	-5.10	-3.10	-5.29	7.31	42.30	40.88
	YSEX?-15 Relational Reasons—ICS Inferiority	-4.80	-2.89	-6.43	4.25	39.25	38.70
	YSEX?-15 Sex as Coping—ICS Superiority	-5.01	-9.59	-13.41	5.74	3.40	-.48
	YSEX?-15 Sex as Coping—ICS Inferiority	-4.88	-9.42	-13.14	14.03	12.29	9.05
H6	SOI-R Behavior—ICS Superiority	-3.96	-5.39	-7.71	3.59	27.05	23.44
	SOI-R Behavior—ICS Inferiority	-3.35	-4.05	-8.29	.80	24.31	19.18
	SOI-R Attitude—ICS Superiority	-4.33	-.23	-4.84	8.08	65.09	59.88
	SOI-R Attitude—ICS Inferiority	-5.01	-.49	-5.05	-1.17	55.80	49.74
	SOI-R Desire—ICS Superiority	-1.72	-1.75	-5.15	20.53	34.36	28.70
	SOI-R Desire—ICS Inferiority	-1.06	.00	-3.80	11.36	24.76	19.55

Note: ICS = Intrasexual Competition Scale; BSSS = Brief Sensation Seeking Scale; BPAQ = Buss-Perry Aggression Questionnaire; ACSS = Acceptance of Cosmetic Surgery Scale; BEBS = Beauty Enhancing Behavior Scale; YSEX?-15 = Brief Version of Reasons for Having Sex Questionnaire; SOI-R = Revised Sociosexual Orientation Inventory.

Hypothesis Testing

Association between intrasexual competition and sensation seeking (H1)

When we examined the association between ICS superiority enjoyment and sensation seeking, as shown in Table 2, the best model was the random intercept model (M2). Intrasexual competition superiority was found to be positively associated with sensation seeking, β = .24, *SE* = .04, Bayesian 95% CI = [.17, .31], 2log(BF) = Infinite.

Association between intrasexual competition and aggression (H2)

We explored the best prediction model for each subscale of the BPAQ (see Table 2 for 2log[modelBF]). First, when we examined the association between superiority enjoyment and physical aggression, the best model was the random slope model. However, $2\log(BF_{32})$, the 2log of the difference between the BF of M3 (random slope model) and M2 (random intercept model), was not greater than 2, so we compared R^2 values between M3 and M2, which were 23.12% and 23.13%, respectively. Thus, we examined the random slope model. The superiority enjoyment was found to be positively associated with physical aggression, β = .24, *SE* = .32, Bayesian 95% CI = [-.25, .70], 2log(BF) = 3.60.

Second, in the case of the verbal aggression, the best prediction model was the random intercept model. However, like the previous case, $2\log(BF_{32})$ was not greater than 2, so we compared R^2 values between M3 and M2, which were 17.40% and 16.18%, respectively. So, we focused on the random slope model. ICS superiority was positively associated with verbal aggression, β = .31, *SE* = .33, Bayesian 95% CI = [-.21, .77], 2log(BF) = 4.24.

Third, when the Anger subscale was examined, the best model was the random intercept model. ICS superiority was positively linked with anger , β = .24, *SE* = .05, Bayesian 95% CI = [.16, .31], 2log(BF) = Infinite.

Regarding the relationship between ICS superiority and hostility, the best model was the random intercept model. However, $2\log(BF_{21})$ was not greater than 2, so we compared R^2 values between M2 and M1, which were 14.37% and 13.07%, respectively. In this model, ICS was positively associated with hostility, β = .26, *SE* = .35, Bayesian 95% CI = [-.26, .76], 2log(BF) = 3.80.

Association between intrasexual competition and frequency of beauty-enhancing behaviors (H3)

We explored the best prediction models for three subscales of the ACSS (interpersonal, social, and consider) (see Table 2). First, when we examined the Interpersonal subscale, the fixed effect model was the best model. A positive association was supported between ICS superiority and the Interpersonal subscale, β = .23, *SE* = .05, Bayesian 95% CI = [.16, .31], 2log(BF) = Infinite.

Second, when we examined the Social subscale, the random intercept model performed the best. In this model, the relation between the ICS superiority and ACSS Social subscale was positive, β = .28, *SE* = .04, Bayesian 95% CI = [.21, .35], 2log(BF) = Infinite.

Third, when the Consider subscale was tested, $2\log(BF_{21})$ did not exceed 2. Thus, we compared R^2s between M2 (6.34%) and M1 (4.21%). R^2s indicated that the random intercept model (M2) was better. In the random intercept model, the association between ICS Superiority and Consider was positive, β = .20, *SE* = .05, Bayesian 95% CI = [.13, .28], 2log(BF) = Infinite.

Association between intrasexual competition and openness to cosmetic surgery (H4)

When the BEBS was examined, the identified best model was the random intercept model (see Table 2). The random intercept model supported a positive relation between ICS and the frequency of beauty-enhancing behavior, β = .06, *SE* = .04, Bayesian 95% CI = [-.01, .13], 2log(BF) = 4.57.

Association between intrasexual competition and reasons for having sex (H5)

First, we examined the relationship between ICS and personal goal attainment. In the case of superiority enjoyment, the random intercept model was the best model. The association was significantly positive, β = .21, *SE* = .04, Bayesian 95% CI = [.13, .28], 2log(BF) = Infinite. When the Inferiority Frustration subscale was tested, the random slope model was best. However, 2log(BF32) was not greater than 2, so we compared R^2 values between M3 and M2, which were 14.11% and 11.70%, respectively. In the random slope model, a positive association was found between inferiority and goal attainment, β = .09, *SE* = .06, Bayesian 95% CI = [.00, .19], 2log(BF) = 6.16.

Second, when the links between the ICS and YSEX-15H Relational Reasons subscale were examined, the random slope model was found to be best. The difference between $2\log(BF_{30})$ and $2\log(BF_{20})$ did not exceed 2, so we examined R^2s. In the case of superiority enjoyment, R^2 of M3 and M2 were 16.30% and 14.43%, respectively. In M3 with the higher R^2, the association was positive, β = .17, *SE* = .32, Bayesian 95% CI = [-.33, .66], 2log(BF) = 2.74. When the Inferiority subscale was tested, the random slope model was also the best. In the model, a significant positive association between inferiority frustration and relational reasons was found, β = .12, *SE* = .33, Bayesian 95% CI = [-.38, .61], 2log(BF) = 2.05.

Third, when we examined the relationship between the ICS Superiority subscale and sex as coping, the fixed effect model was found to be the best. In the model, superiority was positively related with sex as coping, β = .15, *SE* = .05, Bayesian 95% CI = [.07, .23], 2log(BF) = 14.39. Regarding inferiority, $2\log(BF_{21})$ was not greater than 2, so we compared R^2 values between M2 and M1, which were 4.73% and 3.44%, respectively. So, we focused on the random

intercept model, where inferiority frustration was also positively linked with sex as coping, β = .19, *SE* = .05, Bayesian 95% CI = [.11, .27], 2log(BF) = Infinite.

Association between intrasexual competition and sociosexuality (H6)

First, when we examined the associations between superiority enjoyment and sociosexual behavior, the prediction models were significantly better than the null model (see Table 2). However, the difference between $2\log(BF_{30})$ and $2\log(BF_{20})$ did not exceed 2, so we examined R^2s. R^2 of M3 and M2 were 11.93% and 10.81%, respectively. Thus, we decided to examine the random slope model (M3), where superiority enjoyment was positively associated with sociosexual behavior, β = .15, *SE* = .26, Bayesian 95% CI = [-.24, .51], 2log(BF) = 3.14. In the case of the association with ICS inferiority, the best model was the random intercept model. In this model, inferiority was positively linked to sociosexual behavior, β = .14, *SE* = .05, Bayesian 95% CI = [.06, .21], 2log(BF) = 13.81.

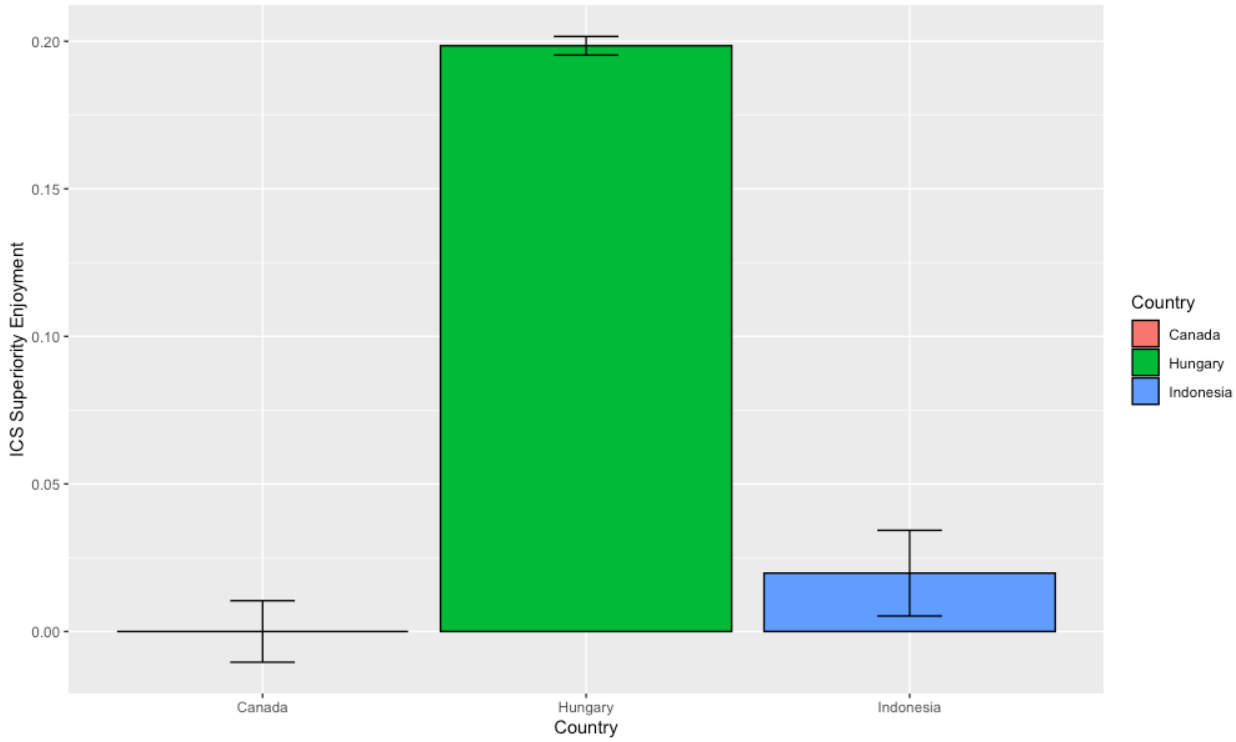
Second, when the associations with sociosexual attitudes were examined, the random intercepts models were found to be the best. Superiority, β = .17, *SE* = .04, Bayesian 95% CI = [.10, .24], 2log(BF) = Infinite, and inferiority were both positively related with sociosexual attitudes, β = .09, *SE* = .04, Bayesian 95% CI = [.02, .16], 2log(BF) = 8.32.

For sociosexual desire, the best models were the random intercept models (M2) for both ICS subscales. Both superiority enjoyment, β = .25, *SE* = .04, Bayesian 95% CI = [.18, .32], 2log(BF) = Infinite, and inferiority frustration were positively related to sociosexual desire, β = .19, *SE* = .04, Bayesian 95% CI = [.11, .26], 2log(BF) = Infinite.

Cross-country comparison in intrasexual competition (H7)

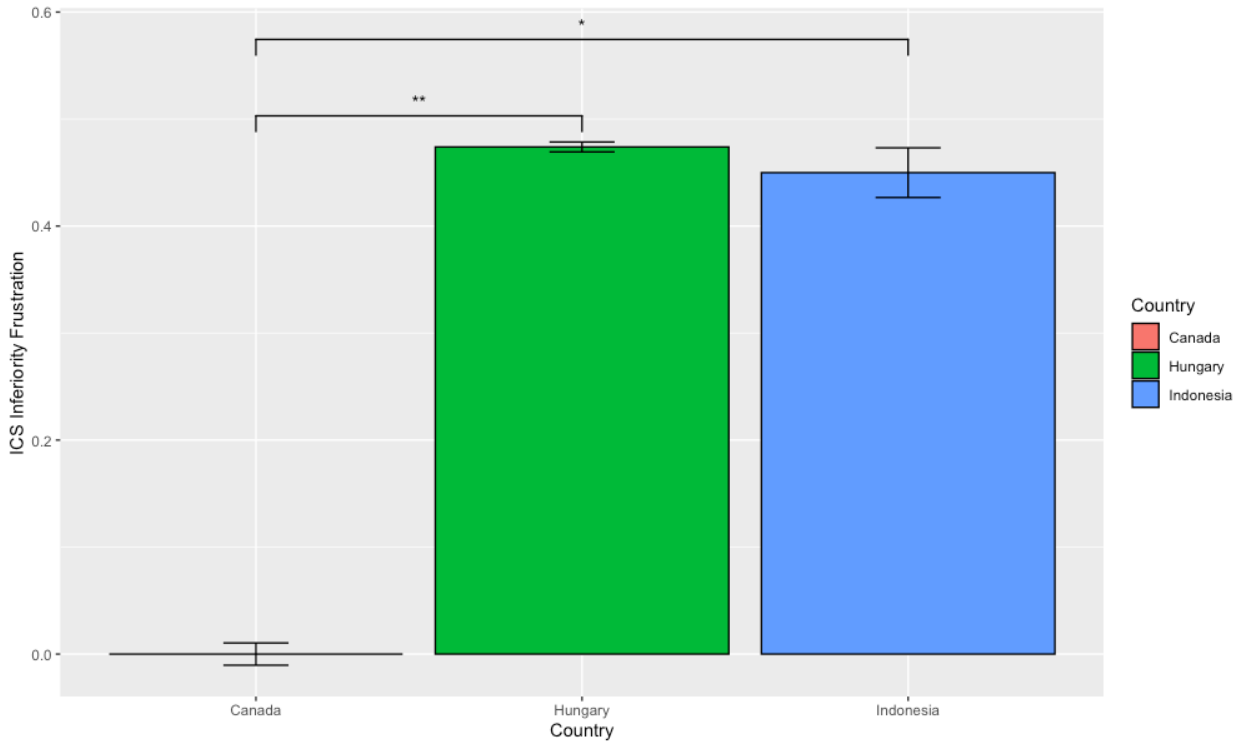
To test H7, we compared the latent group means between Canada, Hungary, and Indonesia, via measurement alignment. When we compared the aligned latent group means in ICS Superiority, after FDR correction, no significant international differences were found (see Figure 1). In contrast, we found several pairwise differences in the latent group mean scores for ICS Inferiority after correction (see Figure 2). Canada demonstrated the significantly lower mean inferiority frustration compared with Hungary and Indonesia. However, the different between Hungary and Indonesia was non-significant.

Figure 1 *Comparison of ICS superiority between countries*



Note: * = $p < .05$. ** = $p < .01$. All *p*-values were FDR corrected.

Figure 2 *Comparison of ICS inferiority between countries*



Note: * = $p < .05$. ** = $p < .01$. All *p*-values were FDR corrected.

Discussion

The current study expands our understanding of the psychology behind same-sex competition and provides a needed comparative analysis of intrasexual competition across cultures. Despite numerous empirical investigations on intrasexual competition using geographically and culturally diverse samples, this study is the first to provide comparative data for three countries regarding the Intrasexual Competition Scale (ICS) [74]. In line with recent research concerning the ICS, we examined a two-factor model for intrasexual competitiveness: superiority enjoyment and inferiority frustration [83]. Additionally, we examined and validated the ICS in both Hungarian and English through measurement invariance testing and alignment. The study revealed several novel results which are discussed below.

Intrasexual Competition and Sensation Seeking

A positive correlation was found between sensation seeking and the superiority enjoyment aspect of intrasexual competition, which supported our hypothesis. Our prediction was based on the findings of Buunk and Fisher [74], as well as Buunk and colleagues [72], who discovered a connection between intrasexual competition and the personality trait of extraversion among men but not among women. Although extraversion is not synonymous with sensation seeking, research suggests a close relationship between the two [112,113,114], which is more characteristic of men than women.

Intrasexual Competition and Aggression

Overall, support was found for H2: intrasexual competition was positively linked with a tendency toward aggressiveness. Positive associations were supported between superiority enjoyment with physical and verbal aggression. However, no correlation between anger and superiority enjoyment was found. This finding contradicted our original hypothesis and suggests that the emotion of anger does not reliably covary with this aspect of intrasexual competitiveness. A positive correlation between hostility and superiority enjoyment was also supported.

The results regarding aggression mirror what was observed earlier with sensation seeking: higher intrasexual competition correlates with higher aggression. These outcomes might be explained partly by the likelihood that female aggression levels are likely higher in interpersonal relationships than previously described.

Burbank [30] found that women employed physical aggression during intrasexual competition in their cross-cultural analysis, especially in societies where polygamy exists. Overall, 61% exhibited physical aggression towards other competing women, which is a similar proportion for men. One reason for this could be that the degree of male aggression has been declining

in certain societies over the last few decades. In a study conducted by Gleeson and Kushnick [115] across 28 societies, higher social status in women predicted reduced sexual dimorphism. This might be due to stronger female choice against larger, aggressive males and/or weaker intrasexual competition among men in societies where women have greater social power. According to Campbell's [116] evolutionary explanation, women's intrasexual aggression evolved because without the motivation and ability to compete for scarce resources, women would not have survived.

Intrasexual Competition, Beauty-Enhancing Behavior, and Openness to Cosmetic Surgery

In support of H3, a positive correlation was found between the frequency of beauty-enhancing behavior and intrasexual competition, specifically superiority enjoyment. This finding reinforces the notion that beauty-enhancing behavior to augment attractiveness can be a means by which individuals engage in intrasexual rivalry [40].

Many researchers have found that the presence of physically attractive women triggers psychological mechanisms related to intrasexual competition in other women. This implies that women compete based on physical appearance [117], perceive those with high attractiveness as threatening [118], and exhibit aggressive behavior towards them [119]. Recent research highlighting economic decline and income inequality, predicts an increase in women's spending on cosmetics and sexualized content on social media [120,121]. Economic decline coincides with a decrease in men's resources, intensifying women's intrasexual competition for resource-rich men. Therefore, competition among women is intertwined with beauty-enhancing behavior: the presence of a physically attractive rival triggers female intrasexual competition, and in response to increased competition, women enhance their beauty as well as employing other strategies [5,39,40]. Hendrickse and colleagues [122] found a positive relationship between intrasexual competition for mates and appearance-related comparisons on Instagram. Women displaying a competitive attitude regarding attracting and retaining partners engaged in more comparisons with potential same-sex rivals on the popular social media platform.

In support of H4, we found a positive correlation between all three aspects of openness to cosmetic surgeries (Interpersonal, Social, and Consider) with superiority enjoyment. Arnocky and Piché [41] obtained similar results when assessing the relation between intrasexual competitiveness and openness to cosmetic surgeries in both men and women. These results might reflect the novel social pressure men experience to showcase the most attractive aspects of physical appearance [123]. In an intersexual context, men's appearance might signal good physical condition crucial for producing healthy, high-quality sperm [124], as well as important

attributes for acquiring social status and resources. Physically attractive men have been found to have higher starting salaries and earn more over time [125]. These findings suggest that the role of men's openness to cosmetic surgery in intrasexual competition could be more nuanced than previously assumed.

Intrasexual Competition and Sexual Motivation

As predicted (H5.1), a positive correlation was found between more self-centered sexual motivation (personal goal attainment) and the superiority enjoyment component of intrasexual competition. Furthermore, in support of H5.2, a positive correlation was supported between more partner-centered sexual motivation (relational reasons) with both superiority enjoyment and inferiority frustration. Moreover, in line with our hypothesis (H5.3), positive associations between using sex as coping with emotional difficulties with both aspects of intrasexual competition were found.

These results align with Buunk and Fisher [74] who found that sex drive was positively linked with intrasexual competitiveness for both Dutch men and women. It is possible that heightened sexual motivation allows women to compete more effectively for short-term mates. Importantly, like men, women may accrue benefits from engaging in short-term sex (e.g., material goods) [60]. Nonetheless, this result draws attention to the significant role that women's sexual motivation may play in their psychology regarding competition with other women.

Intrasexual Competition and Sociosexuality

Positive correlations were supported between all three factors of sociosexuality (behavior, attitudes, and desire) with both superiority enjoyment and inferiority frustration. However, only in the case of sociosexual attitudes and desire, we found the margin~~al~~ associations between SOI and ICS subscales. These results provide support for H6.

Davis et al. [64,66] found significant relationships between intrasexual competition and unrestricted sociosexuality, which were not sex specific. Thus, within the context of intrasexual competition, both men and women appear to employ short-term mating strategies. However, there have been inconsistent findings in this literature. Buunk and Fisher [74] found a positive correlation between unrestricted sociosexuality and intrasexual competition in their sample of Dutch, but not Canadian, university students. Fiacco and colleagues [71] conducted a study with young adult Swiss women but found no correlation between sociosexuality and intrasexual competition. Semenyna et al. [126] found that women with unrestricted sociosexuality exhibited higher sexual competitiveness. In a sample of Chilean men, Figueroa et al. [69] found no correlation between intrasexual competition (self-reported fighting abilities) and unrestricted

sociosexuality. Therefore, more research is needed to make sense of these equivocal findings regarding the links between sociosexuality and intrasexual competition.

Cross-Country Differences in Intrasexual Competition

When conducting comparative analyses of the two subscales of intrasexual competition, we found no difference between Canada, Hungary, and Indonesia for superiority enjoyment. However, regarding inferiority frustration, Canadian respondents reported the lowest competition scores on average, whereas there was no difference between Hungarian and Indonesian scores. This result contradicts the hypothesis predicting that individualistic-oriented, loose-cultured Canadian participants would report higher intrasexual competition scores compared to collectivist-oriented tight-cultured Indonesian participants. Furthermore, with the Hungarian scores differing from the Canadian scores and not the Indonesian scores, the result contradicted H7.

A pivotal aspect distinguishing cultures is the continuum between individualism and collectivism [127,128]. Societies exhibiting pronounced collectivism emphasize strong interpersonal bonds within their community, whereas societies leaning toward individualism prioritize self-reliance and self-governance [129]. An alternative perspective suggests that cultures can be differentiated based on the extent of tightness or looseness, determined by the strength of societal norms and the measures governing and penalizing behaviors [130,131]. In close-knit societies, norms are explicit and strict consequences are imposed on those diverging from them, emphasizing the importance of knowing and adhering to these norms within such cultures [132,133,134].

Although it is challenging to precisely define Hungarian values compared to the cultural characteristics of Canada and Indonesia, previous research implies that Hungarian culture combines both Eastern and Western traits in economic [135], family [136], sexuality [137], and broader societal values [138]. The results of the current study paint a picture that in terms of intrasexual competition, Hungary bears more similarity to Indonesia than to Canada.

Our findings are intriguing considering previous Indonesian studies on sexuality. Hartoyo and Abraham [139] reported more conservative attitudes towards cybersex openness compared to Western norms. Khaerina and Abraham [140] highlighted that authoritarian social/political norms may have a limiting impact on the sexual development of adolescents. Abraham and Rahardjo [141] also reported that Indonesian urban adolescents characterized more by psychopathic personality traits, like their Western counterparts, were more open to premarital sex than those less characterized by this personality trait. These studies illustrate that cultural norms

regarding sexuality in different countries can lead to varied expressions of intensity and pathways in sexual behaviors.

Limitations and Future Directions

The current study addressed the need for more cross-cultural work on intrasexual competition and related facets of human mating psychology. However, due to the exploratory nature of the study, the results cannot provide a complete picture of the mechanisms through which examined factors influence competition for mating partners among individuals of the same sex.

The cross-sectional nature of the current research is also a notable limitation. Self-report questionnaires may introduce bias, and future studies should clarify the reproducibility of measurements using the ICS and different factor structures for the scale. Recently, neither Albert et al. [83] nor Jonason and colleagues [75] were able to replicate the original ICS [74] single-factor solution, and instead found the two- and three-factor solutions to be more appropriate. More research, like this current work, is needed to further examine these reliability and validity of these newer models for intrasexual competition.

We also need to consider the disproportional sample sizes across different countries. Only 96 participants were recruited from Indonesia, whereas 124 and 272 participants were recruited from Canada and Hungary respectively. The small sample size in Indonesia might have contributed to the larger standard error in this group, and perhaps the non-significant correlations in the analysis with the inferiority frustration component of intrasexual competitiveness. Therefore, further investigations with more representative sampling are necessary for a more precise portrayal of the relationships explored in this study. It would also be prudent to examine cultural-level variables that might help to account for differences between nations, such as level of income inequality [40].

Conclusion

The current study is unique in measuring the associations of intrasexual competition with psychological constructs with an international sample. These constructs include sensation seeking, aggression, beauty enhancement behaviors, openness to cosmetic surgery, sexual motivation, and sociosexuality. The study takes an important step towards understanding the phenomenon of intrasexual competition across different cultures or demographic groups, alongside individual-level factors. The study's primary strength lies in its cross-cultural nature and the use of multiple questionnaires, allowing for the systematic examination of impacts of individual and cultural variables. This allows for a more nuanced understanding of intrasexual competition, providing key insights into the psychology of human mate selection. The findings may

also result in more effective methods to counterbalance potential negative psychological consequences associated with sexual competition.

The present research contributes to the literature on intrasexual competition by replicating some previous results wherein the same measurement instrument was used (the ISC; [74], including the positive links between intrasexual competition with acceptance of cosmetic surgery and sociosexuality. Novel relationships using the ISC were also supported, such as the positive relation between intrasexual competition with sensation seeking. We further established relations not previously investigated between intrasexual competition with beauty enhancement behavior and sexual motivation). A cross-cultural analysis of the ISC across three different nations (Canada, Hungary, and Indonesia) was also provided. These results were also supported by newer and more precise statistical methods (Bayesian approach) used to analyze the data.

Human Ethics and Consent to Participate Declarations

Ethics approval declaration: This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Hungarian United Ethical Review Committee for Research in Psychology (EPKEB) under Reference No. 2023/52.

Availability of data and materials: All collected data that support the findings of this study, and R codes for analysis can be found on the Open Science Framework project website: https://osf.io/7a6qr/?view_only=be4c9ef8d3744cfd951ded2205025f88

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3 | EXCHANGES OF SEX FOR RESOURCES

3.1 Providing Sexual Companionship for Resources: Development, Validation, and Personality Correlates of the Acceptance of Sugar Relationships in Young Women and Men Scale (ASR-YWMS)[8]

Béla Birkás[1*], Norbert Meskó[2], András N. Zsidó[2], Dóra Ipolyi[2], András Láng[2]

[1] Medical School, University of Pécs, Pécs, Hungary

[2] Institute of Psychology, University of Pécs, Pécs, Hungary

Abstract

A sugar relationship is a transactional sexual relationship in which a younger partner (sugar baby/boy) offers companionship and sexual services to a much older partner (sugar daddy/mommy) in return for material compensation. One aim of the present study was to develop an attitude scale assessing young women's and men's acceptance of sugar relationships. Another aim was to explore the possible associations of the acceptance of sugar relationships with psychological functioning in an intimate partner relationship and in a sexual relationship and with certain socially undesirable personality traits. Two online studies were conducted with a total number of 2052 participants (1879 women; age = 18–28 years). The results show that the Acceptance of Sugar Relationships in Young Women and Men Scale (ASR-YWMS) is a reliable and valid measure of young people's attitude toward sugar relationships. The studies revealed that young women's and men's accepting attitude toward sugar relationships was positively associated with unrestricted sociosexuality, a game-playing love style (Ludus), self-focused sexual motivation (Study 1; N = 319; 272 women and 47 men), and with socially undesirable traits such as Machiavellianism, subclinical psychopathy, and a borderline personality organization (Study 2; N = 1733; 1607 women and 126 men). These findings suggest that a relatively high level of acceptance of sugar relationships is part of a mating strategy focused on opportunities of maximizing resources. This utilitarian, risk-taking and exploitative attitude is characteristic to a fast life history strategy, and it is a fundamental organizing principle of psychological and sexual functioning in intimate partner relationships.

Keywords: acceptance of sugar relationships, scale development, validation, personality correlates, transactional sex.

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Introduction

Transactional Sex

Transactional sex describes transactions, in which one partner provides resources for the other in exchange for the latter's immediate sexual availability. This presumably evolved, complex bio-psycho-social process affected mate choice throughout human history and even in modern populations. Differences in mate choice preferences related to sexual dimorphism (e.g., number of partners) are suggested to be an important factor in the emergence of this phenomenon (e.g., Buss and Schmitt, 1993, 2019; Conroy-Beam et al., 2019a, b; Walter et al., 2020). For instance, Trivers (1972) points out that women's and men's mate choice preferences show marked differences as a result of sex differences in reproductive biology (e.g., in the amount of energy invested in procreation). Since male (but not female) reproductive success was essentially influenced by the number of available sexual partners in the evolutionary past, maximizing the number of partners is still a characteristic sexual strategy among men. This short-term mating strategy (i.e., mating with the largest possible number of partners) is limited by the number of women available for casual sex in a given population. Furthermore, promiscuous sexual behavior potentially entail direct parental investment for women (due to pregnancy) but not for men. For this reason, men are more willing to engage in short-term sexual encounters (e.g., Schmitt, 2005; Buss and Schmitt, 2019).

Accordingly, one of the most common evolutionary explanations for men's more pronounced motivation for engaging in transactional sex attributes this sex difference to men's need for promiscuity (e.g., Symons, 1979; Burley and Symanski, 1981; Salmon, 2008). The sexual strategies theory (Buss and Schmitt, 1993, 2019) describes transactional sex (e.g., prostitution) as an extremely short-term mate choice strategy and draws a parallel between mate choice and marketing in terms of their underlying mechanisms (see Buss and Foley, 2019). Salmon (2008) goes as far as suggesting that since men are much more willing than women to engage in purely physical casual sexual encounters, and they actively seek such encounters, this preference is a clearly favorable condition for transactional sex.

Another line of research on the essential sex differences in mate choice preferences focuses on men's marked attraction to relatively young women (e.g., Seto, 2017; Conroy-Beam and Buss, 2019). Heterosexual men are generally attracted to women in their twenties, independently of their own age, whereas very few men are exclusively attracted to very young or very old women (e.g., Kenrick and Keefe, 1992; Antfolk et al., 2015; Tripodi et al., 2015). This pattern has been demonstrated in modern Western and non-Western cultures (Buunk et al.,

2001; Antfolk, 2017; Walter et al., 2020), and it is also supported by indirect evidence from hunter-gatherer societies (e.g., Early and Peters, 2000; Marlowe, 2004) and from pre-industrial societies (e.g., Dribe and Lundh, 2009). In sum, men are attracted to young women, while they have limited opportunity to engage in sexual activity with such women (depending on their own attractiveness, social status, the time and energy required by courtship, and the generally poor prospects for a satisfying long-term relationship with a much younger woman), thus they strive to fulfill their needs through transactional sex (e.g., Kenrick and Keefe, 1992; Ringdal, 1997; Buunk et al., 2001). Arunachalam and Shah (2008) reported earnings data of a sample of more than 4,000 Mexican and Ecuadorian sex workers. Although not discussed by the authors, their data show that female sex workers' income precisely follows the age trend in fecundity: earnings are relatively low until they peak in the early to mid-twenties, which is followed by gradual decline. The association between income and fertility is corroborated by the finding that the same age-related trend in income is not shown by female non-prostitutes, whose income peaks in their late forties (Arunachalam and Shah, 2008). Similar association between age and other cues to female fertility have been found in a study of Polish prostitutes (Prokop et al., 2018): physical signs of fertility in female prostitutes predict the prices of sexual services, and women showing better signs of fertility offer their services at higher prices. A study conducted with American female escorts (a common euphemism for sexual services) found that younger women charged higher fees than their older counterparts (Griffith et al., 2016). The costs of sex are apparently higher for young escorts. These findings are consistent with those reported by Dunn (2018), who found that younger escorts advertising their sexual services online offered services at higher prices than older escorts. Similar findings have been reported by Sohn (2016a,b, 2017a,b), who studied Indonesian men's preferred age of potential female partners, their sensitivity to signs of female fertility, and their preferences related to services provided by female prostitutes.

Sugar Relationship

A sugar relationship is a form of transactional sexual relationship in which an older and wealthier partner (sugar daddy/mommy) provides material resources to a younger partner (sugar baby/boy) in return for her or his companionship (Nayar, 2016). Partners usually spend leisure time together, and sexual activity is only involved if both partners give their consent. Such transactional sexual relationships were quite common as early as centuries ago (Nelson, 1993). Nowadays, due to digital technology, potential partners are able to find each other more easily (e.g., Nayar, 2016; Botnen et al., 2018), and can maintain their privacy by using websites designated to arrange sugar relationship[1,2,3]. Sugar relationship are not banned by law in most

Western countries even though the related legal issues have been fiercely debated not only from a legal viewpoint but also from social and moral perspectives (e.g., Miller, 2011; Motyl, 2012; Jones, 2014; Motz, 2014). One of the most debated legal issues is whether sugar relationships are to be considered a form of prostitution (e.g., Motz, 2014). In several countries, where prostitution (and active support for prostitution) is banned, the availability of web services designed for managing sugar relationships are not restricted or limited (e.g., Miller, 2011; Motyl, 2012). That is, these countries maintain a legal distinction between being involved in prostitution and being involved in a sugar relationship. Those protesting against sugar relationships on a moral basis target their efforts at eliminating this legal vacuum (e.g., Jones, 2014).

The nature of sugar relationship has been studied in various scientific approaches. A sociological study, for example, adopted a primarily descriptive approach to the motives underlying university students' involvement in the sex industry (Sagar et al., 2016). Feminist research focuses on issues such as, for example, the role of power and agency in sugar relationship (e.g., Cordero, 2015). A study adopting an economic viewpoint found that a relatively large proportion of young women pursuing expensive university studies registered at websites designated to arrange sugar relationship, which are considered by the author as a form of human capital investment (Mixon, 2019).

Another line of research on "sex for compensation" phenomena is devoted to female university students' involvement in the sex industry. Preble et al. (2019) consider sugar relationship between young university students and their older and wealthier partners as a transactional sexual relationship that provides better conditions for the former to pursue studies, a career, or a higher social status in general. Betzer et al. (2015) assessed a large number of university students and found that those engaging in transactional sex (i.e., sex work) received significantly less financial support from their families, used drugs more frequently (e.g., cocaine), and scored lower on the Agreeableness subscale of the Big Five Inventory than other participants. Other findings also revealed socially undesirable personality traits in university students involved in transactional sex (e.g., Edwards, 2017; Blum et al., 2018). Furthermore, studies conducted in economically developed East Asian countries highlight the importance of a materialistic worldview as a possible explanation for many young women's willingness to provide sexual services to older men in exchange for material compensation (e.g., Cheung et al., 2016; Song and Morash, 2016; Krisch et al., 2019).

Accordingly, gaining better insight into the psychological aspects of sugar relationship (e.g., correlations with personality traits, love and sexual styles, etc.), is still wanting. One reason for this is that most participants in previous questionnaire and interview studies had not

been directly involved in a sugar relationship or transactional sex. For example, in the study by Betzer et al. (2015), only 227 out of 4386 participants reported to have engaged in transactional sex, while 2998 had never been involved in a transactional relationship, and 1161 did not respond. Edwards (2017) assessed 820 participants, of which 94 reported to have at least once engaged in transactional sex. These findings suggest that female students involved in sugar relationship form a "hidden population," which is not easily accessible for empirical research (Haeger and Deil-Amen, 2010).

Love Styles, Sociosexuality and Sexual Motives

Previous studies exploring the psychological processes involved in man-woman relationships primarily focused on phenomena such as romantic love, sociosexuality and sexual motivation rather than on transactional sex. Therefore, the combination of these related theories is important to adequately contextualize the issues concerning the motivation for engaging in a sugar relationship.

Love styles can be described as systems of attitudes and beliefs characterized by different emotional tones, which are related to certain personality traits (Lee, 1988). Three primary love styles can be distinguished: Eros (passionate, romantic; seeking the ideal and perfect love), Ludus (playful, uncommitted love; looking at love as a game), and Storge (friendship evolves to love). Secondary love styles are balanced mixtures of the three primary styles: Pragma (practical, rational love) is a combination of Storge and Ludus, Mania (obsessive or addictive love) is a combination of Eros and Ludus, and Agape (altruistic or unselfish love), a combination of Eros and Storge. Thus, the model consists of a total of six different love types, which describe individual differences in love (e.g., Raffagnino and Puddu, 2018). This classification is relatively complex, comprehensive, and consistent with everyday experience and language (Hendrick et al., 2006). Frey and Hojjat (1998) found consistent positive correlations between a preference for commitment and all love attitudes apart from Ludus, which negatively correlated with commitment. These results were supported by other findings establishing a positive relationship between Ludus and unrestricted sociosexual orientation (e.g., Jonason and Kavanagh, 2010; Lee et al., 2013; Proyer et al., 2018; Smith et al., 2019).

The term sociosexuality originally referred to the diversity of male and female sexual behavior (Jonason et al., 2019). This initial construct was extended incorporating short-term and long-term mating interest, past sexual behavior (Jackson and Kirkpatrick, 2007) and the desire as a new component (Penke and Asendorpf, 2008). Accordingly, an instrument was developed to measure individual differences in attitudes toward casual sex and related forms of behavior (Simpson and Gangestad, 1991) and was subsequently supplemented with the desire

component (Penke and Asendorpf, 2008). Previous studies on the psychological contexts of sociosexuality have revealed that men are more willing to engage in casual sex than women, which applies globally (Schmitt, 2005; Lippa, 2009). In addition, unrestricted socio-sexuality is positively associated with mating effort maximization, while restricted sociosexuality is more closely related to parental efforts (Valentova et al., 2020). Finally, unrestricted sociosexuality positively correlates with openness to casual sex among online dating site users (Hallam et al., 2018). However, a related study found that unrestricted sociosexuality was associated with participants' willingness to engage in casual sex only when it was accompanied by a low level of commitment in a long-term relationship (Rodrigues and Lopes, 2017).

Sexual motives are commonly defined as the conscious and subjective reasons stated by men and women for engaging in sexual activity (e.g., Meston and Buss, 2007; Hatfield et al., 2012; Meston and Stanton, 2017). Sexual activity is closely related to several biopsychosocial factors and contextual elements of the relationship including the type and duration of the relationship, and the partners' attachment styles (Meston and Stanton, 2017). A number of studies revealed sex differences in sexual motivation (e.g., Meston and Buss, 2007; Meston et al., 2009, 2019), suggesting, that women's sexual activity is primarily based on relationship-related reasons, while men are more likely to have self-focused reasons. Armstrong and Reissing (2015) studied the associations between relationship type and sexual motivation, and they found more pronounced physical motives in those who preferred casual sexual relationships, while those currently having a committed relationship showed stronger emotional motives. Developing emotional attachment to a prospective partner is not a necessary condition for engaging in casual sex, since neither partner expects to be involved in a committed relationship offering long-term benefits. The Hungarian Short Form of the Reasons for Having Sex Questionnaire (YSEX?-HSF; Meskó et al., 2019) is a self-report instrument similar to the original questionnaire in item composition and slightly different in factor structure which characteristics support both, the cross-cultural universality of human sexual motivation and also the cultural diversity (reflected in the differences of the factor structure). Initial results with the YSEX?-HSF indicated, that self-centered and stress-related motives for sex were positively associated with unrestricted sociosexuality.

This suggests that one's willingness to engage in a sugar relationship is part of a utilitarian orientation characterized by the (mutual) exploitation of partners, and by a sexual strategy based on the maximization of the number of partners.

Aims of Study 1

To the authors' knowledge, no instrument measuring the attitude toward engaging in a sugar relationship has been developed yet. Such an instrument would enable researchers to obtain a more detailed picture of the psychological aspects of sugar relationship by assessing samples of both directly involved individuals and the average population.

In consistence with the above discussed literature, the present research focused on the following two aims: (1) development of a self-report instrument measuring the acceptance of sugar relationships, and its validation with other measures of psychological functioning in intimate partner-, and sexual relationships; (2) verification of the hypothesis that the acceptance of sugar relationships is positively associated with self-beneficial behaviors in intimate partner relationships, a game-playing love style, and unrestricted sociosexuality.

Study 1

Hypotheses and Predictions

The aim of Study 1 was to test the validity of the ASR-YWMS. The validation process tested the following hypotheses.

Hypothesis 1

Based on the fundamental psychological characteristics of male and female mating preferences and strategies (e.g., Ohno, 1967; Trivers, 1972; Walsh, 1993), we hypothesized that men would have a more positive attitude toward sugar relationships than women.

Hypothesis 2

Based on the results of previous research exploring the relationship between transactional sex and materialistic values (e.g., Cheung et al., 2016; Song and Morash, 2016; Krisch et al., 2019), we hypothesized that individuals with a more positive attitude toward sugar relationships would have more materialistic, utilitarian and self-focused views on romantic relationships and sexuality compared to individuals with a less positive attitude toward sugar relationships. The following predictions were derived from the above hypothesis.

Prediction 1

Based on previous findings on multifactorial sexual motivation (e.g., Meston and Buss, 2007; Meskó et al., 2019), we hypothesized that individuals with a more positive attitude toward sugar relationships would view sex as a means to achieve personal or relational goals (as reflected in a positive association of the ASR-YWMS with personal goal attainment and sex as coping).

Prediction 2

Related to the former prediction, we expected individuals with a more positive attitude toward sugar relationships to view intimacy and commitment as unnecessary for getting involved in sexual relationships (as reflected in a negative association of the ASR-YWMS with relational motives).

Prediction 3

In line with previous findings on the psychological correlates of openness to casual sex (e.g., Schmitt, 2005; Penke and Asendorpf, 2008; Lippa, 2009), we expected individuals with a more positive attitude toward sugar relationships to have a more unrestricted sociosexual attitude (as reflected in a positive association of the ASR-YWMS with the SOI).

Prediction 4

Transactional sexual relationships generally lack the emotional intimacy characteristic of committed relationships (e.g., Scull, 2019) and so can be connected with previous findings about positive associations between a game-playing love style (Ludus) and unrestricted sociosexual orientation (e.g., Jonason and Kavanagh, 2010; Lee et al., 2013; Proyer et al., 2018; Smith et al., 2019). Accordingly, we hypothesized that individuals with a more positive attitude toward sugar relationships would view love as a source of pleasure without commitment (as reflected in a positive association between the ASR-YWMS and the Ludus love style).

Prediction 5

Based on previous findings on love styles, we hypothesized that individuals with a more positive attitude toward sugar relationships would view sexual attraction, commitment, and friendship as inessential ingredients of love (as reflected in a negative association of the ASR-YWMS with the Eros, Agape, and Storge love styles).

Method

Item Generation and Selection

Item generation did not follow the procedure conventional in psychological research (e.g., Loevinger, 1957), but an existing questionnaire entitled the Acceptance of Cosmetic Surgery Scale (ACSS; Henderson-King and Henderson-King, 2005) was adapted for the purposes of the present study. This instrument measures the level of openness to cosmetic surgery, and it has been translated into several languages and used in hundreds of studies conducted in various cultures over the past 25 years (for an overview, see Meskó and Láng, 2019).

The choice of the instrument was based on the well-established empirical finding that the acceptance of cosmetic surgery is related to self-objectification (e.g., Calogero et al., 2010, 2014; Vaughan-Turnbull and Lewis, 2015; Choi and DeLong, 2019), which means treating one's own body as an object with a detached attitude. Since several studies have found that one's involvement in transactional sex is also related to self-objectification (Chen, 2016; Horley and Clarke, 2016; Gayathri et al., 2018; Endong, 2019; Maas et al., 2019), this latter was expected to function as a latent variable determining a positive association between one's attitude toward cosmetic surgery and that toward transactional sex. The ACSS comprises three subscales, which structure was kept in the scale adapted for the acceptance of sugar relationships. One subscale of this latter assesses the *intrapsychic* component, that is, one's perception of the potential personal benefits associated with engaging in a sugar relationship (e.g., "It makes more sense to be involved in a sugar relationship than to feel depressed for years by a bad financial situation"). Another subscale measures the *social* component, which reflects one's perception of engaging in a sugar relationship as a normative behavior sanctioned by one's immediate environment (e.g., friends) or the wider society (e.g., "If it was beneficial for my future life, I would consider engaging in a sugar relationship"). The third subscale measures the *consideration* component, which reflects one's willingness to consider engaging in a sugar relationship despite potential unfavorable consequences also weighed before decision making (e.g., "If I knew that it did not entail disapproval or negative consequences, I would like to try a sugar relationship").

That is, the items were generated by translating the 15 items of the ACSS (Henderson-King and Henderson-King, 2005) into Hungarian and then rewording each item in such a way that the original subject (i.e., cosmetic surgery) was replaced with sugar relationship (see the questionnaire in Appendix 1). The obtained instrument was entitled Acceptance of Sugar Relationships in Young Women and Men Scale (ASR-YWMS). Since it was hypothesized that younger and older parties would be driven by different motives to engage in a sugar relationship, another version of the instrument was also developed for an older age group (entitled Acceptance of Sugar Relationships in Older Men and Women Scale; ASR-OMWS). Although data were simultaneously collected in the two age groups, only the version developed for younger people and the related findings are presented in this paper. Findings on the older age group will be published in a separate paper.

Some of the items of the newly acquired questionnaire were highly similar. To address this issue, we decided to develop a shorter and, thus, a more feasible version of the ASR-YWMS. First, we used confirmatory factor analysis (CFA) to check the unidimensionality of

the latent variables as the item response theory (IRT) requires unidimensional latent variables. The ACSS has three subscales, therefore we used the same model for the ASR-YWMS and analyzed the three subscales separately. For this purpose, we used the graded response model (GRM) of item response theory (Samejima, 1969) and examined the psychometric properties of each item. We selected items that had a very high (>1.7) discrimination ability (Baker, 2001). Then, we observed the item information functions (IIF) of these items and selected those with the highest values from each subscale. Some of the items had very similar IIF curves and were synonymous in meaning. From these, we selected the one that we thought had a better wording and represented the latent variable it was intended to measure better. During these analyses, data from the two studies presented in this paper were merged to obtain a larger sample (N = 2052, 1879 women and 173 men, age range: 18–28, M = 21.61, SD = 3.16; see further details in "Sample and Procedure" of this study and of Study 2) and, thus, a better accuracy.

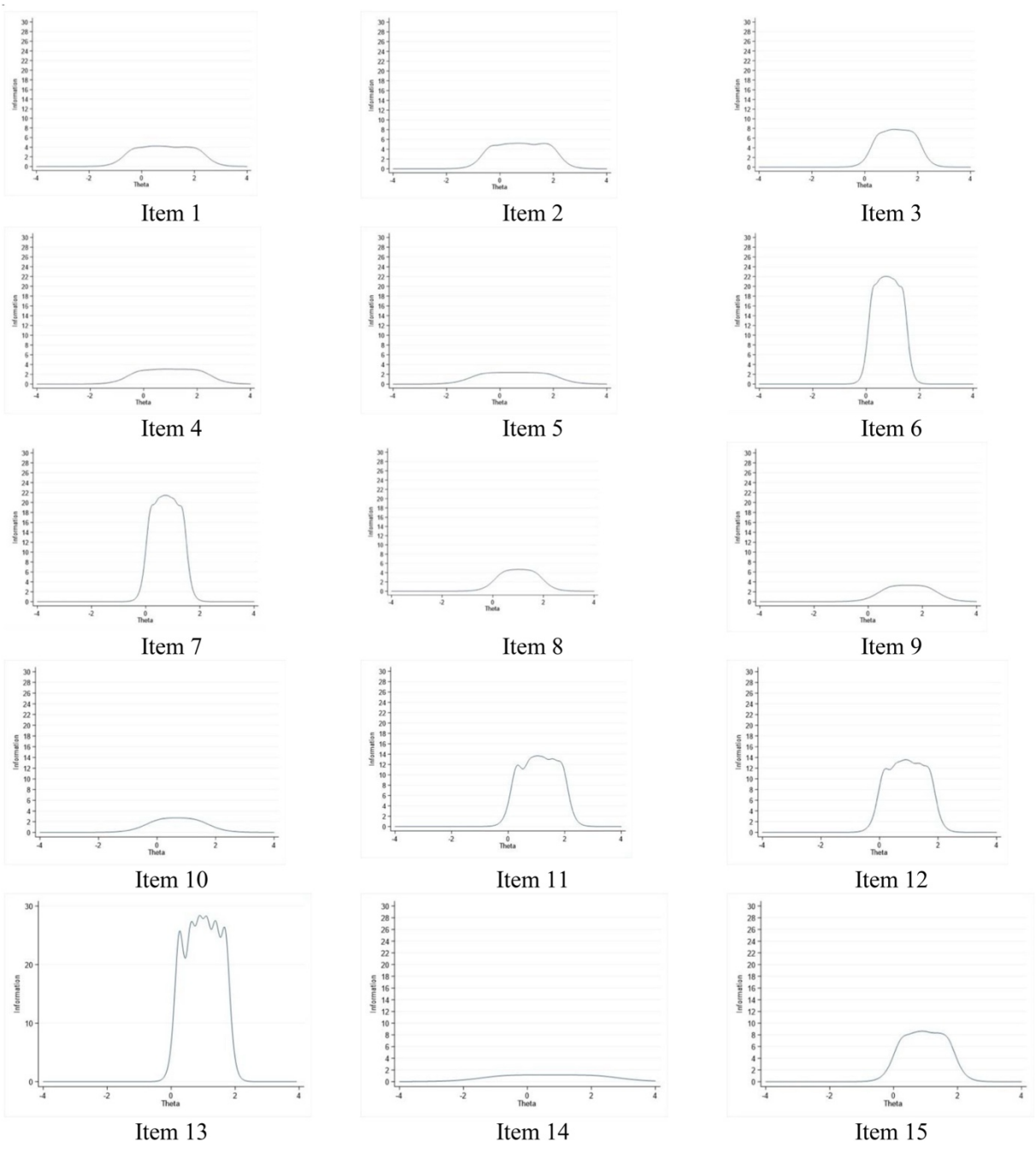
The three-factor CFA (TLI = 0.969; CFI = 0.975; RMSEA = 0.070 [90% CI = 0.066 – 0.074]; SRMR = 0.023) showed an excellent fit (Hu and Bentler, 1998). The GRM showed that all items have very high (>1.7) discrimination ability. Based on the IIFs, we selected items 1 and 2 from the first subscale (items 1, 2, 4, 5, and 14) but they were very similar, and thus, we decided to only use item 2 that also had a slightly better IIF (see Figure 1). We selected items 11, 12, and 13 from the second subscale (items 9, 11, 12, 13, and 15) but items 11 and 12 were very similar so we chose to drop item 11 and keep only items 12 and 13. Finally, we selected items 3, 6 and 7 from the third subscale (items 3, 6, 7, 8, and 10) but items 6 and 7, again, had close to identical IIFs, therefore we chose to retain items 3 and 7 only. Since only a small number of items remained after the analyses, keeping the original three-factor model would not be impractical. Thus, we propose to use the questionnaire with a single factor comprising all five items (nr 2, 3, 7, 12, and 13).

Sample and Procedure

After giving informed consent, 319 participants (272 women and 47 men) completed the questionnaires. Participants' age ranged between 18 and 28 years (M = 24.64, SD = 2.77). Relationship status: currently single (19.4%); has casual relationships but no permanent partner (9.4%); is in a committed relationship/married but does not live with the partner (32.2%); is in a committed relationship/married and lives with the partner (39.2%). Registered at a dating site (11.0%); registered at a site designated to arrange sugar relationships (0.9%); registered at both types of sites (2.8%); not registered at either type of sites (85.3%). Currently involved in a sugar relationship (4.1%). Total number of sexual partners: 0 (3.1%), 1 (14.1%), 2 (11.3%), 3 (6.0%), 4 (6.3%), 5–6 (16.6%), 7–9 (13.5%), 10–19 (14.4%), 20 or more (14.7%). Place of residence:

small village (4.7%); large village (2.5%); small/medium-sized town (11.6%); municipal town/city (23.8%); capital city and its agglomeration (57.4%).

Figure 1 *Item information curves for the 15 items of ASR-YWMS starting from* ***(top left)*** *item 1 to* ***(bottom right)*** *item 15*



Data were collected online. The survey was edited in Google Forms. The link to the survey was disseminated via Facebook and via one of the most popular and influential Hungarian internet portals, Index[4]. All participants gave informed consent, and none of them was rewarded

for participation. The research plan received ethical approval from the Hungarian United Ethical Review Committee for Research in Psychology (Ref. No. 2018/115).

Instruments

Acceptance of sugar relationships in young women and men scale (ASR-YWMS)

The ASR-YWMS is the scale whose development, reliability analysis and validation were the objectives of the present study. The item generation procedure and sample items were presented previously, while the psychometric properties of the scale are discussed below. The scale contains five items (see Appendix 1). Cronbach's α for the ASR-YWMS in the present study was 0.95.

Love attitudes scale, short form (LAS-SF; Hendrick et al., 1998)

The LAS-SF contains 24 items, which compose the following six subscales: Eros (erotic, romantic, passionate love style), Ludus (game-playing love style), Storge (affectionate, friendship-oriented love style), Pragma (rational, shopping-list love style), Mania (possessive, dependent love style), and Agape (selfless love style). Each subscale has four Likert items, and respondents indicate the extent to which each item applies to them on a 5-point rating scale ranging from 1 (strongly disagree) to 5 (strongly agree). Thus, higher scores reflect higher preference for the specific love style. Cronbach's α values for the six subscales were as follows: Eros: 0.77; Ludus: 0.73; Storge: 0.88; Pragma: 0.60; Mania: 0.72; Agape: 0.83.

Sociosexual orientation inventory, revised (SOI-R; Penke and Asendorpf, 2008; adapted to hungarian by Meskó et al., 2014)

The SOI-R comprises nine items assessing one's willingness to engage in uncommitted sexual encounters. The items compose three subscales measuring the three components of behavior, attitude and desire. Responses are given on 9-point rating scales (scale anchors vary across items). Higher scores on each subscale indicate more unrestricted sociosexuality in terms of behavior, attitude and/or desire. Cronbach's α values for the three subscales and the overall scale were as follows: Behavior: 0.87; Attitude: 0.83; Desire: 0.90; SOI-R (overall): 0.88.

Reasons for having sex questionnaire, hungarian short form (YSEX?-HSF; Meskó et al., 2019)

The YSEX-HSF is a self-report instrument assessing sexual motivation. The Hungarian version differs from the original YSEX? four factor questionnaire. The scale comprises 73 items, which compose the following three subscales: Personal goal attainment, Relational reasons, Sex as coping. Each item is rated on a 5-point scale offering the following options: 1 = "None of my sexual experiences"; 2 = "Few (…)"; 3 = "Some (…)"; 4 = "Many (…)"; 5 = "All of my sexual experiences." Thus, higher scores reflect higher levels of the measured sexual

motive. Cronbach's α values for the three subscales were as follows: Personal goal attainment: 0.91; Relational reasons: 0.92; Sex as coping: 0.91.

Results

To test Hypothesis 1, we compared men's and women's scores on the ASRS with an independent samples *t*-test. Men ($M = 17.11$; $SD = 9.80$) – compared to women ($M = 13.27$; $SD = 9.16$) – scored significantly higher on the ASRS [$t(317) = 2.622$; $p < 0.01$] with a medium effect size (Hedges' $g = 0.41$). Thus, results confirmed Hypothesis 1. Men tended to have a more positive attitude toward sugar relations than women.

The predictions of Hypothesis 2 were tested with Pearson's correlation coefficients. Results of these analyses along with the means and standard deviations of the variables are shown in Table 1. Acceptance of sugar relationships showed a significant positive association with two sexual motives including personal goal attainment and sex as coping. Both correlations were moderate in magnitude. The importance of relational reasons for sexual relationships was unrelated to the acceptance of sugar relationships. Regarding sociosexuality, all subscales and thus the total score consistently showed significant positive associations with the acceptance of sugar relationships. All correlations were moderate in magnitude. Concerning love styles, the acceptance of sugar relationships was significantly associated with the Eros, Ludus, and Agape love styles. It showed a low negative correlation with Eros, a moderate positive correlation with Ludus, and a marginal negative correlation with Agape. Although the correlation between the acceptance of sugar relationships and Agape was statistically significant, its magnitude was considered negligible. The acceptance of sugar relationships was unrelated to any of the Storge, Pragma, and Mania love styles. In line with the results of Pearson's correlations, a multiple linear regression analysis (Supplementary Material 1) confirmed sociosexuality and Ludus love style as having the strongest unique relationship with acceptance of sugar relationships.

In sum, the results confirmed Predictions 1, 3, and 4 of Hypothesis 2. Individuals with a more positive attitude toward sugar relationships tended to have sex out of self-focused reasons, and they also tended to use sex as a means of coping with distress or relational problems. Furthermore, they were less restricted in sociosexual orientation and more willing to engage in sexual relationships without commitment. This was also reflected in their views on love. Individuals with a more positive attitude toward sugar relationships tended to see love as a source of pure pleasure unrestricted by exclusivity. Prediction 5 of Hypothesis 2 was partly confirmed. Individuals with a more positive attitude toward sugar relationships viewed

Table 1 *Association between acceptance of sugar relationships and criterion variables; results of Pearson's correlations and means and standard deviations of the measured variables*

	ASR- YWMS	YSEX?-HSF			SOI-R				LAS-SF					
		Personal Goal Attainment	Relational Reasons	Sex as Coping	Behavior	Attitude	Desire	Total	Eros	Ludus	Storge	Pragma	Mania	Agape
ASR- YWMS	–	0.457**	−0.029	0.358**	0.438**	0.396**	0.459**	0.529**	−0.267**	0.543*	−0.016	−0.010	0.116	−0.154*
M	13.84	45.11	85.24	39.45	10.03	18.99	10.90	39.92	16.72	7.99	9.61	8.83	9.74	11.60
SD	9.34	15.61	21.38	14.38	6.33	7.10	6.44	16.14	2.97	3.79	4.91	3.42	3.86	3.97

**p < 0.01; **p < 0.001. ASR-YWMS, Acceptance of Sugar Relationships in Young Women and Men Scale. YSEX?-HSF, Why Have Sex – Hungarian Short Form. SOI-R, Sociosexual Orientation Inventory Revised Version. LAS-SF, Love Attitude Scale – Short Form.*

intimacy, security, and sexual aesthetics as inessential ingredients of love, whereas the subjective importance of friendship and commitment in a love relationship was unrelated to participants' attitude toward sugar relationships. The results did not support Prediction 2 of Hypothesis 2. Individuals' attitude toward sugar relationships was unrelated to the sexual motives of intimacy, love, and physical attraction

Discussion

Study 1 contributed some essential insights into the nature of sugar relationship. The findings suggest that individuals engaging in a sugar relationship approach to intimate partner relationships tend to have a more self-focused attitude toward sexuality and love, which is associated with the predomination of self-interest in their relationship-related motives. These results are consistent with previous findings that revealed a positive association between a game-playing love style (Ludus) and unrestricted sociosexual orientation (e.g., Jonason and Kavanagh, 2010; Lee et al., 2013; Proyer et al., 2018; Smith et al., 2019).

In the present study, young participants with a more accepting attitude toward sugar relationships appeared more willing to use sex as a means to attain personal goals or to cope with problems as compared to those with a less accepting attitude toward sugar relationships (H2, P1). However, no association was found between relational motives for having sex and the acceptance of sugar relationships (as opposed to the expected negative correlation; see H2, P2), which questions the assumption that young people are led by cold and calculating rationality (i.e., by a lack of need for intimacy) to engage in such transactional sexual relationships. It is possible that being together with an intimate partner as a reason for having sex is simply irrelevant in a sugar relationship. This possibility is supported by certain findings obtained in former studies (e.g., Ryan, 2019; Scull, 2019).

All three components of unrestricted sociosexuality (i.e., behavior/experience, attitude, and desire reflecting a preference for uncommitted sexual encounters) showed positive associations with the acceptance of sugar relationships (H2, P3). That is, young participants with a more accepting attitude toward transactional sex reported to have had more casual relationships, had more frequent fantasies of such encounters and appeared less disapproving of them as compared to those with a less accepting attitude toward sugar relationships. These findings are in line with recent studies that obtained similar results in relation to tertiary students' involvement in sex work and in promiscuity (e.g., Okafor and Duru, 2010; Sanders and Hardy, 2015; Mensah, 2019).

Data on participants' love-related psychological characteristics revealed a similar picture. Those showing a more accepting attitude toward sugar relationships reported a higher preference for the game-playing Ludus love style than those with a less accepting attitude toward transactional sex (H2, P4). By contrast, a negative correlation was obtained for the Eros love style: those more willing to accept sugar relationship were less likely to be involved in a passionate love relationship based on physical attraction as compared to those less approving of transactional sex (H2, P5). The acceptance of sugar relationships was not related to any of the other love styles including the friendship-oriented Storge, the practical and predictable Pragma, the obsessed and overwhelming Mania, and the selfless Agape. These love styles appear to be irrelevant in the context of transactional sexual relationships. Although no previous study focused specifically on the association between love and sugar relationship, comparable findings were obtained in studies examining the relationship between love and openness to uncommitted sex (e.g., Jonason and Kavanagh, 2010; Proyer et al., 2018; Jonason et al., 2019).

Finally, young men reported a more accepting attitude toward sugar relationships than young women (H1). Participants' sexual orientation was not recorded in Study 1, therefore it was assumed that heterosexual participants formed the majority of the sample (in consistence with available data on the average population) (e.g., Gates and Newport, 2012; Lam, 2016). Accordingly, the obtained sex difference was interpreted in a heterosexual context, and as such it is in line with the predictions of the Sexual Strategies Theory (Buss and Schmitt, 1993). This theory suggests that men strive to maximize the number of sexual partners as a result of the increased reproductive success associated with this strategy in the evolutionary past. By contrast, maximizing the number of sexual partners did not directly increase women's reproductive success. It is presumable, however, that young men involved in heterosexual sugar relationship do not approach older women with the implicit prospect of procreation. Therefore, the importance of this motive in sugar relationship is yet to be clarified.

Transactional sexual relationships appear to offer an adequate form of intimacy to individuals with a strong preference for short-term relationships enabling them to utilize exploitative interpersonal tactics. The findings of Study 1 on the relationship between sociosexuality and sexual motivation point to the possibility that an accepting attitude toward sugar relationships is part of a short-term mating strategy.

In summary, those participants of the present study showing relatively high acceptance of sugar relationships reported a preference for a game-playing, manipulative love style, unrestricted sociosexuality, and self-focused sexual motivation. These findings call for an empirical

analysis of the relationship between the acceptance of sugar relationships and socially undesirable personality traits or personality organization, which was the subject of Study 2.

Study 2

Introduction

The findings of Study 1 raise the question of what personality traits may be associated with an accepting attitude toward sugar relationships. Openness to short-term relationships is known to be associated with specific patterns of personality traits. A related study found that unrestricted sociosexuality was positively associated with extraversion and negatively associated with agreeableness and conscientiousness (Schmitt and Shackelford, 2008). Another line of related studies explored prostituted women's personality traits and psychopathological features and found that prostitutes scored higher on impulsive sensation seeking than the control group (O'Sullivan et al., 1996). Furthermore, Brody et al. (2005) found that adult female prostitutes were exposed to an increased risk of borderline personality disorder (BPD). In a similar vein, Tull et al. (2011) also reported that patients with BPD were more likely to be involved in prostitution than non-BPD patients.

Other studies revealed that women engaging in transactional sexual relationships showed clinical symptoms of antisocial/psychopathic personality disorder (Brody and Potterat, 2010; Edwards and Verona, 2016; Edwards, 2017). Moreover, Brody et al. (2005) explicitly suggest that due to the social conditions and psychodynamics characteristic to transactional sex, prostitutes meet virtually all diagnostic criteria of antisocial personality disorder as defined in the DSM-IV (American Psychiatric Association, 1994).

Several of these psychopathological features (e.g., low self-control, selfish interpersonal behavior) are associated with certain socially aversive personality traits collectively referred to as the Dark Triad (DT). The DT is a personality construct that includes three interrelated traits: Machiavellianism, subclinical psychopathy, and subclinical narcissism (Paulhus and Williams, 2002). There are several characteristics common to the three DT traits such as callousness, being manipulative (Jones and Paulhus, 2011), diminished self-control (Jonason and Tost, 2010), a more present-oriented time perspective (Birkás and Csathó, 2015), inability to delay gratification (Brumbach et al., 2009; Birkás et al., 2015), and being exploitative (McDonald et al., 2012). In a study conducted with 225 non-patient university students (130 females), Láng (2015) found a positive correlation between Machiavellianism and borderline personality organization.

Dark Triad traits were found to be positively correlated with various dimensions of short-term mating but not with long-term mating (Jonason et al., 2009). In a recent study, Collisson et al. (2019) examined a rather peculiar behavior: the researchers wanted to know how frequently women engaged in foodie calls (i.e., how often they set up a date with someone for a free meal), and what personality traits were associated with an accepting attitude toward such dates. The results revealed that 23–33% of the female participants had at least once engaged in a foodie call. Those having had related experience viewed foodie calls more socially acceptable than those without any experience. Both engaging in, and showing an accepting attitude toward, foodie calls positively correlated with the DT traits. More specifically, those women who were willing to offer companionship in return for a free dinner, while having no intention to have a second date with the male partner, showed relatively high levels of socially undesirable traits such as Machiavellianism and subclinical psychopathy. Furthermore, Brazil and Forth (2019) reported that female participants found men with higher levels of psychopathy more attractive than other men. The results showed that the observed men's psychopathic tendencies were positively associated with sociosexuality, with specific factors of social intelligence, and with female participants' desirability ratings when controlling for the men's physical attractiveness. People with higher levels of DT traits are also more prone to lower their mate selection standards, by which they expand the choice of potential partners and improve their prospects for short-term relationships (Jonason et al., 2012).

The results of Study 1 showed that an accepting attitude toward sugar relationships was associated with a manipulative love style, self-focused sexual motivation, and a preference for short-term relationships. The acceptance of sugar relationships may also be associated with DT traits, particularly with Machiavellianism and psychopathy. Edwards (2017) revealed in an empirical analysis that female and male university students providing sexual services for material compensation showed higher levels of impulsive-antisocial traits (impulsivity, irresponsibility, sensation seeking) than those who did not engage in such activity. These findings are in line with those reported by Blum et al. (2018), who found that university students' involvement in transactional sex was associated with high-risk sexual behavior and certain mental problems. Those willing to have sex for compensation showed higher levels of impulsivity, compulsive sexual behavior, anxiety and traumatization, and lower self-esteem. In sum, the findings suggest that those having sex for material compensation possess several socially undesirable personality traits and have various difficulties with social adaptation.

Aims of Study 2

The aim of Study 2 was to test the expected associations between the acceptance of sugar relationships and socially aversive personality traits (e.g., Brody et al., 2005; Brody and Potterat, 2010; Tull et al., 2011; Edwards, 2017; Blum et al., 2018) and to replicate the previously obtained sex difference in the attitude toward sugar relationship (e.g., Buss and Schmitt, 1993, 2019; Gangestad and Simpson, 2000; Walter et al., 2020). In addition, we also expected to be able to confirm the unidimensional structure of the ASR-YWMS explored in Study 1.

Hypothesis 1 predicted that a similar sex difference would be observed in the acceptance of sugar relationships as that found in Study 1.

Hypothesis 2 included two predictions on the associations between the acceptance of sugar relationships and socially aversive personality traits. First, participants with a more positive attitude toward sugar relationship were expected to score higher on DT trait measures (i.e., subclinical narcissism, subclinical psychopathy, Machiavellianism; Prediction 1). Second, participants with a more positive attitude toward sugar relationships were expected to show severer symptoms of borderline personality organization (Prediction 2).

Method

Sample and Procedure

After giving informed consent, 1733 participants (1607 women and 126 men) completed the questionnaires. Participants' age ranged between 18 and 28 years (M = 21.05, SD = 2.91). Relationship status: currently single (37.8%); has casual relationships but no permanent partner (5.7%); is in a committed relationship/married but does not live with the partner (35.4%); is in a committed relationship/married and lives with the partner (21.2%). Registered at a dating site (11.1%); registered at a site designated to arrange sugar relationship (0.7%); registered at both types of sites (1.4%); not registered at either type of sites (86.8%). Total number of sexual partners: 0 (2.4%), 1 (13.5%), 2 (24.8%), 3 (15.6%), 4 (10.9%), 5–6 (9.4%), 7–9 (10.0%), 10–19 (7.7%), 20 or more (6.6%). Place of residence: small village (6.5%); large village (5.7%); small/medium-sized town (17%); municipal town/city (29.4%); capital city and its agglomeration (41.5%).

Data were collected online. The survey was edited in Google Forms. The link to the survey was disseminated via Facebook and via one of the most popular and influential Hungarian internet portals, Index[4]. All participants gave informed consent, and none of them was rewarded for participation. The research plan received ethical approval from the Hungarian United Ethical Review Committee for Research in Psychology (Ref. No. 2019/51).

Instruments

Acceptance of sugar relationships in young women and men scale (ASR-YWMS)

The ASR-YWMS is the scale whose development, reliability analysis and validation were the objectives of the present study. Cronbach's α for the ASR-YWMS in the present study was 0.937.

Borderline personality inventory (BPI; Leichsenring, 1999)

The BPI is a 53-item self-report measure of borderline personality organization (BPO). Since the non-clinical sample of Study 2 was expected to show relatively mild features of BPO, the original "yes-no" response format of the BPI was replaced with four-point rating scales (ranging from "never" to "always") more sensitive to subclinical psychopathology, thus the BPI was used as a Likert scale (for a previous application of this procedure, see Láng, 2015). The BPI measures four aspects of BPO: Identity Diffusion, Fear of Fusion, Primitive Defense Mechanisms, and Impaired Reality Testing. Since Study 2 only concerned BPO as a global construct, only the overall score and not the subscale scores on the BPI were included in the data analysis. The overall BPI scale showed high internal consistency (Cronbach's α = 0.93).

Short dark triad (SD3; Jones and Paulhus, 2014)

The SD3 is a 27-item self-report instrument, whose three subscales measure three socially aversive personality traits: Machiavellianism (e.g., "Generally speaking, people won't work hard unless they have to"), subclinical narcissism (e.g., "Many group activities tend to be dull without me"), and subclinical psychopathy (e.g., "It's true that I can be nasty"). Each subscale comprises nine Likert items, and each item is rated on a 5-point scale. Cronbach's α values for the three subscales were as follows: Machiavellianism: 0.75; Narcissism: 0.75; Psychopathy: 0.73.

Results

The expected sex difference in the acceptance of sugar relationships was tested with an independent samples *t*-test. Men ($M = 17.21$, $SD = 10.52$) as compared to women ($M = 11.44$, $SD = 7.85$) scored significantly higher on the ASR-YWMS [$t(136.123) = 6.029$, $p < 0.001$] with a moderately large effect size (Hedges' $g = 0.71$). That is, men reported a more positive attitude toward sugar relationships than women. This finding confirmed Hypothesis 1, and replicated the sex difference obtained in Study 1.

The predictions of Hypothesis 2 were tested with Pearson's correlation coefficients (see Table 2). The results revealed significant positive associations between the acceptance of sugar relationships and all three socially aversive personality traits. The correlations obtained for Machiavellianism and subclinical psychopathy were low to moderate in magnitude, while

narcissism showed a correlation of negligible strength. Thus, Prediction 1 of Hypothesis 2 was partly confirmed. Participants with a more positive attitude toward sugar relationships reported more pronounced Machiavellian and psychopathic traits, whereas narcissism appeared to be conceptually unrelated to the acceptance of sugar relationships. Prediction 2 of Hypothesis 2 was confirmed. Participants with a more positive attitude toward sugar relationships reported more pronounced features of borderline personality organization. In line with the results of Pearson's correlations, a multiple linear regression analysis (Supplementary Material 2) conformed the unique relationship of all three dark personality traits and borderline personality organization with the acceptance of sugar relationships.

Discussion

The results of Study 2 confirmed both the expected factor structure of the ASR-YWMS (H1, P1) and the predicted sex difference in the acceptance of sugar relationships, that is, men scored significantly higher on the ASR-YWMS than women (H1, P2). Another important finding of Study 2 was the obtained positive association between the acceptance of sugar relationships and each of the assessed socially aversive personality traits (H2, P1). That is, participants reporting a more accepting attitude toward sugar relationship showed higher levels of Machiavellianism and subclinical psychopathy. These results are consistent with findings of related previous studies, which revealed that the DT traits were positively associated with a preference for short-term intimate partner relationships, and with women's manipulative, amoral tactics related to female intrasexual competition (Honey, 2017; Semenyna et al., 2018, 2019).

Table 2 *Association between acceptance of sugar relationships and socially aversive personality traits; results of Pearson's correlations and means and standard deviations of the measured variables*

	ASR-YWMS	SD3			BPI
		Machiavellianism	Subclinical psychopathy	Subclinical narcissism	
ASR-YWMS	–	0.351	0.349	0.191	0.267
M	11.86	27.34	19.82	23.75	78.22
SD	8.21	6.57	6.24	6.17	18.20

All correlations are significant at the level of $p < 0.001$. ASR-YWMS, Acceptance of Sugar Relationships in Young Women and Men Scale. SD3, Short Dark Triad. BPI, Borderline Personality Inventory.

The acceptance of sugar relationships was also positively associated with borderline personality organization (H2, P2). This suggests that a transactional sexual relationship is more likely to be endorsed by those who are particularly prone to show inadequate or extreme emotional reactions, to engage in impulsive behavior, and to be involved in intimate partner relationships that lack stability. This finding is in line with results of several previous studies

revealing a relationship between borderline personality organization and sexual impulsivity (e.g., Sansone et al., 2008; Frías et al., 2016).

Importantly, the present study was conducted with a sine morbo sample, the majority of whom lived in a committed intimate partner relationship (in marriage or in a permanent relationship), and nearly 87% of whom were not registered at any sites designated to arrange dates or sugar relationship. In light of these sample characteristics, it is particularly interesting that positive associations were observed between the acceptance of sugar relationships and socially aversive traits such as Machiavellianism, subclinical psychopathy, and borderline personality organization. These findings suggest that those are the most likely to show interest in transactional sex who possess socially aversive personality traits to a certain extent.

In consistence with Study 1, the findings obtained in Study 2 also offer themselves for a more detailed explanation. Several studies revealed a close relationship between DT traits and mate choice preferences and strategies. These findings suggest that the forms of sexual behavior associated with DT traits generally fail to meet social norms and moral standards, and as such they are maladaptive. More specifically, socially aversive traits may also prove efficient in meeting certain adaptive challenges to mating and survival, while the potential advantages of these traits are primarily realized not through support provided for genetic relatives but through self-beneficial strategies such as the desire for status.

General Discussion

In summary, the present studies revealed novel findings in several respects. On one hand, the Acceptance of Sugar Relationships in Young Women and Men Scale (ASR-YWMS) is the first questionnaire, to the authors' knowledge, that has been designed to measure the acceptance of sugar relationships. On the other hand, the present paper is the first to empirically analysis of the attitude toward sugar relationship (transactional sex) in an evolutionary approach.

The ASR-YWMS provides a self-report measure of the acceptance of sugar relationships as a specific form of transactional sexual relationships among young adults who are willing to offer companionship and/or sexual services for material compensation. The questionnaire is a reliable and valid instrument showing the expected associations with intimate partner relationships, sexual motivation, and sociosexual orientation. The obtained findings revealed that the acceptance of sugar relationships was positively associated with a preference for short-term intimate partner relationships as reflected in unrestricted sociosexuality, self-focused (as opposed to relationship-focused) sexual motivation, and a game-playing, manipulative love style (as opposed to an eros-based love style, with which the acceptance of sugar relationships was

negatively associated). Furthermore, the findings also revealed that an accepting attitude toward sugar relationship was positively associated with socially aversive personality traits such as manipulation (Machiavellianism), exploitation (subclinical psychopathy), and fear of intimacy combined with a general inner instability (borderline personality organization).

However, the two studies presented in this paper also touch upon issues outside the scope of the proximate factors underlying young women's and men's attitude toward sugar relationships. Namely, the above mentioned personality traits, relationship-related preferences, love styles and sexual motives appear to be interrelated elements of individual lifestyles or worldviews rather than a set of intrapsychic and interpersonal functions unrelated to each other. The findings suggest that an accepting attitude toward sugar relationships is part of a fundamentally goal-directed mating strategy focused on opportunities of maximizing resources. This utilitarian, short-term oriented, risk-taking and exploitative attitude appears to be a fundamental organizing principle of psychological and sexual functioning in intimate partner relationships.

Limitations

It has to be noted that the obtained findings only provide indirect insights into the nature of sugar relationship, since only a small fraction of participants reported to have been directly involved in such relationships. For this reason, the ASR-YWMS should be used in further studies to assess the attitude of young people engaging in sugar relationship. In addition, the instrument should be completed with a behavioral measure to explore the association between transactional sexual behavior and the attitude toward sugar relationships.

Furthermore, the present studies only focused on one side of sugar relationship, that is, on those young people who offer companionship (sexual services) in return for resources. A more comprehensive understanding of the phenomenon requires a complementary analysis of the other side focusing on the psychological characteristics of those older people who provide resources for their young partners. This analysis will be published separately due to the limited scope of the present paper. Findings on both sides may contribute to a better understanding of the psychological factors and evolutionary mechanisms underlying the attitude toward sugar relationships.

Conclusion

Keeping the above mentioned limitations in mind, the results of the development and validation of the ASR-YWM show that the self-report questionnaire provides a valid measure of young people's willingness to engage in a sugar relationship. The obtained findings support the idea that openness to transactional sex (e.g., to sugar relationships) in young people is

associated with a preference for short-term relationships, a playful love style, self-centered sexual motivation, and aversive personality traits such as subclinical psychopathy, Machiavellianism, and borderline personality organization. We have demonstrated that these associations may also be observed in the average population. One's utilitarian mating strategy based on exploiting others and oneself probably is at play not only when one is currently involved in a sugar relationship. Future research is needed to understand what other psychological functions (e.g., self-esteem, attachment, motivation, etc.) may be associated with one's willingness to engage in a sugar relationship. Furthermore, it is important to adequately clarify the significance of other evolved mating-related strategies (i.e., Life History Strategies) in one's openness to sugar relationships. Most importantly, our study has shown that varying degrees of openness to sugar relationships in young individuals may be a fundamental part of mating psychology.

Data Availability Statement

The datasets generated for this study are available on request to the corresponding author.

Ethics Statement

The studies involving human participants were reviewed and approved by the Hungarian United Ethical Review Committee http://epkeb.ttk.hu/. The patients/participants provided their written informed consent to participate in this study.

Author Contributions

NM, AL, and BB: conceptualization. NM and DI: methodology. AL and AZ: formal analysis and investigation. NM, BB, and AL: writing – original draft preparation. BB, AL, DI, and AZ: writing – review and editing. BB and NM: funding acquisition. NM and AL: resources. NM: supervision.

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Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Footnotes

1. https://www.seeking.com/
2. https://sugardaddie.com/
3. https://www.sugar-babies.com/
4. https://index.hu/

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Appendix 1

Acceptance of Sugar Relationships in Young Women and Men Scale (ASR-YWMS)

A sugar relationship is a transactional sexual relationship in which an older and wealthier partner (sugar daddy/mommy) provides material resources to a younger partner (sugar baby/boy) in return for her or his companionship. Partners usually meet to spend leisure time together, and sexual activity is only involved if both partners give their consent. Please indicate the extent to which you agree with each of the below statements using the seven-point rating scales ranging from (1) "absolutely disagree" to (7) "absolutely agree".

absolutely disagree						absolutely agree
1	2	3	4	5	6	7

1. It makes sense to engage in a sugar relationship rather than spending years feeling bad about your financial situation.	1 2 3 4 5 6 7
2. A sugar relationship is a good thing because it can help the sugar baby/boy have a satisfactory financial situation.	1 2 3 4 5 6 7
3. In the future, I could end up engaging in a sugar relationship.	1 2 3 4 5 6 7
4. People who are very unhappy with their financial situation should consider engaging in a sugar relationship as one option.	1 2 3 4 5 6 7
5. If sugar relationship can make someone happier with their financial situation, then they should try it.	1 2 3 4 5 6 7
6. If I could engage in a sugar relationship without risking exposure, I would consider trying it.	1 2 3 4 5 6 7
7. If I knew I would not incur negative judgment or consequences, I would like to try a sugar relationship.	1 2 3 4 5 6 7
8. I have sometimes thought about engaging in a sugar relationship.	1 2 3 4 5 6 7
9. I would seriously consider engaging in a sugar relationship if my best friend thought it was a good idea.	1 2 3 4 5 6 7
10. I would never engage in any kind of sugar relationship.	1 2 3 4 5 6 7
11. I would think about engaging in a sugar relationship in order to have a better financial situation.	1 2 3 4 5 6 7
12. If it would benefit my career, I would think about engaging in a sugar relationship.	1 2 3 4 5 6 7
13. I would seriously consider engaging in a sugar relationship if I thought it would help me have a better financial situation.	1 2 3 4 5 6 7
14. A sugar relationship can be a big benefit to people in terms of how they feel about their financial situation.	1 2 3 4 5 6 7
15. If a short-term sugar relationship made me more satisfied with my financial situation, I would think about trying it.	1 2 3 4 5 6 7

Scoring guide: Reverse-scored item: 10

Note: Bold items represent the 5-item version of ASR-YWMS

3.2 It Takes Two to Tango: Development, Validation, and Personality Correlates of the Acceptance of Sugar Relationships in Older Men and Women Scale (ASR-OMWS)[9]

András Láng[1], Béla Birkás[2], András N. Zsidó[1], Dóra Ipolyi[1], Norbert Meskó[1*]

[1] Institute of Psychology, University of Pécs, Pécs, Hungary

[2] Department of Behavioral Sciences, Medical School, University of Pécs, Pécs, Hungary

Abstract

Sugar relationships can be considered contemporary forms of transactional sex, that is, offering sexual services for material resources or other benefits. Considering the common age differences in these relationships, sugar relationships might be of relevance for older adults as well on the mating market. As a sequel to Birkás et al. (2020), in the present study, an attitude scale was developed to assess older women's and men's acceptance of sugar relationships. We also explored whether the acceptance of sugar relationships was associated with love styles, sociosexual orientation, sexual motivation, and certain socially aversive personality traits. In two online studies with a total number of 836 participants (N = 277 women and 559 men), the results showed that the Acceptance of Sugar Relationships in Older Men and Women Scale (ASR-OMWS) proved to be a reliable and conceptually valid measure of older individuals' attitude toward sugar relationships. A more accepting attitude toward sugar relationships was found to be associated with more unrestricted sociosexuality, preference to engage in playful love relationships and more self-focused sexual motivation (study 1; N = 481, 167 women and 314 men), and with more pronounced Dark Triad and borderline traits (study 2; N = 355, 110 women and 245 men). Our findings are discussed in an evolutionary framework.

Keywords: acceptance of sugar relationships, scale development, validation, personality correlates, transactional sex.

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Introduction

Sugar relationship can be described as a form of affair between a well-to-do man (sugar daddy) and less frequently woman (sugar mommy) who is willing to financially compensate (through monetary or other form of rewards) his/her young in-need partner (sugar baby; a female, or less frequently, sugar boy, a male) in return for a form of companionship they agreed upon (Nayar, 2016). This transactional form of relationship could be well understood and investigated in a model describing the variations of mating preferences referred to as the "mating market" (Pawlowski and Dunbar, 1999). As suggested by its name, the mating market describes a two-way process of finding romantic partners. Individuals on the market advertise their potentially desirable characteristics as a potential partner, whereas they also proclaim desired qualities of their potential mates (Pawlowski and Dunbar, 1999). Sugar relationships might be specific in the sense that advertised and desired partner qualities are explicitly stated and negotiated.

Within the evolutionary context, human mating strategies vary according to the individual's reproductive potential and reproductive investment (Buss, 1994). Since women invest more in parenting (a potential outcome of mating compared with men), they show stronger preferences for partners with signs of capability of parental investment (i.e., financial stability or higher level of education; Buss, 1989; Anderson and Klofstad, 2012; Walter et al., 2020). More for men than for women, partners with physical signs of reproductive potential (youth, attractiveness) are evaluated as more desirable mates (e.g., Buss, 1989; Walter et al., 2020). However, it is important to note, that in long-term relationships, both men and women prefer physical attractiveness, but men value it more (Buss, 1989; Walter et al., 2020).

Mating preferences also vary according to the "mate value" of the individual, that is, the ability and willingness to invest resources in the relationship (i.e., quality and stability) and in raising offspring. The structure of the mating market suggests that individuals with higher mate value are rated as more desirable by potential partners; thus, they can aim for a similarly high-valued partner. Correspondingly, individuals with more desirable traits can expect higher mate value for their "offer" in the mating market (Pawlowski and Dunbar, 1999). Reproductive potential declines with age, especially for women. As a result, mating strategies might change over time, but basic mate preferences only decrease in magnitude (Buss, 1989; Li et al., 2002; Conroy Beam and Buss, 2019; Conroy-Beam et al., 2019; Walter et al., 2020). Thus, both older women and men value physical attractiveness and social status of the potential partner as less important and prefer indicators of commitment and other traits promoting to engage in a more

intimate relationship (Alterovitz and Mendelsohn, 2011; Fales et al., 2016). Moreover, older individuals tend to be less selective and expect less mate value from their partners; perhaps as a trade-off due to the decrease of their mate value (lower levels of health and physical attractiveness) (Li et al., 2002; Fales et al., 2016; Seto, 2017). Accordingly, sugar relationship can be considered an alternative platform for adaptive mating preferences. Older individuals in modern societies frequently accumulate financial resources which they can possibly offer to potential partners, whereas the companionship of younger individuals can be valuable not only for intimacy but also for increasing the social prestige of the older partner.

Personality traits are keys to advertise and to identify desirable characteristics on the mating market (e.g., Birkás et al., 2018). With age, mating preferences shift from physical traits to more personality-related characteristics (Alterovitz and Mendelsohn, 2011; Fales et al., 2016). Thus, it is plausible to suggest that personality traits and individual attitudes play a central role in relationship choices and might be important factors in forming sugar relationships, but in different ways for younger and older counterparts. Birkás et al. (2020) recently published their research report about a questionnaire that was developed to measure the accepting attitude of young women and men toward a sugar relationship. However, sugar relationships are dyadic and asymmetric (e.g., Nayar, 2016; Hoss and Blokland, 2018). The previously mentioned measure only taps the mindset of younger partners, who provide companionship and/or sexual relationship for resources. This paper presents the development of a supplementary questionnaire to measure the acceptance of sugar relationships among older men and women, i.e., among those who might be willing to provide resources for (sexual) companionship.

Aim of the Current Studies

The primary aim of the current studies was to develop and validate an instrument that allows for the measurement of attitudes toward sugar relationships in older adults. Thus, these studies are a sequel to the studies in Birkás et al. (2020). Using the same instruments as in Birkás et al. (2020) also allowed us to compare the pattern of correlations in the two samples as a function of age. Thus, these studies also add to our knowledge the nomological network of the attitude toward sugar relationships in two different age groups. Furthermore, our study also aimed to provide some additional support for the mating market model and the relevance of personality-related factors in forming mating strategies and preferences when bargaining for a partner. As basic mate preferences only decrease in magnitude with age (Buss, 1989; Li et al., 2002; Conroy Beam and Buss, 2019; Conroy-Beam et al., 2019; Walter et al., 2020), in this older sample, we expected the same pattern of correlations as reported in Birkás et al. (2020).

Method

Sample and Procedure

We used two separate samples in this study. The first sample completed the Acceptance of Sugar Relationships in Older Men and Women Scale (ASR-OMWS), Love Attitudes Scale, Short Form (LAS-SF), Sociosexual Orientation Inventory, Revised (SOI-R), and Reasons for Having Sex Questionnaire, Hungarian Short Form (YSEX?-HSF) and consisted of 481 Hungarian participants (314 males), aged 40–69 years (M = 47.8, SD = 6.46). The second sample completed the ASR-OMWS, Borderline Personality Inventory (BPI), and Short Dark Triad (SD3) and consisted of 355 Hungarian participants (245 males), aged 40–71 years (M = 48.7, SD = 7.43). (See complete demographic data for both samples in Table 1).

Table 1. Demographic data of the two samples of the study.

Demographics	First sample N = 481	Second sample N = 355
Relationship status		
currently single	12.1%	15.2%
has casual relationships but no permanent partner	6.2%	5.9%
is in a committed relationship/married but does not live with the partner	15.4%	12.7%
is in a committed relationship/married and lives with the partner	66.3%	66.2%
Registered website user		
registered at a dating site	13.7%	13.8%
registered at a site designated to arrange sugar relationships	4.4%	2.5%
registered at both types of sites	5.0%	5.9%
not registered at either type of sites	76.9%	77.7%
Currently involved in a sugar relationship	8.3%	
Lifetime sexual partners		
0	0	0
1	3.7%	1.4%
2	3.5%	5.9%
3	3.3%	6.8%

4	4.4%	4.5%
5-6	11.6%	5.6%
7-9	12.1%	15.8%
10-19	22.5%	40.8%
20 or more	38.9%	19.2%
Place of residence		
small village	2.9%	5.6%
large village	2.1%	3.1%
small/medium-sized town	13.1%	13.5%
municipal town/city	19.5%	20.6%
capital city and its agglomeration	62.4%	57.2%

We used separate samples for the love, sociosexuality, sexual motivation (first sample), and personality trait (second sample) scales as participants filled out these scales as part of various other, larger studies. Data were collected online. The survey was edited in Google Forms. The link to the survey was disseminated *via* Facebook and *via* one of the most popular and influential Hungarian Internet portals to time, Index[1]. All participants gave informed consent, and none of them was rewarded for participation. The research plan received ethical approval from the Hungarian United Ethical Review Committee for Research in Psychology (Ref. No. 2018/115 and Ref. No. 2019/51).

Item Generation and Selection

Since the items were identical in ASR-YWMS (Birkás et al., 2020) and ASR-OMWS with the exception of the subject of the sentences, we used reformulated items from ASR-YMWS (Birkás et al., 2020). For further information about item generation, see Birkás et al. (2020) (see the questionnaire in Appendix 1). To test the psychometric feasibility of the one-factor short form of the questionnaire, we pooled the sample of the two studies (N = 836, 277 women and 559 men, age range: 40–71, M = 48.2, SD = 6.90) and conducted a confirmatory factor analysis (CFA) with the robust weighted least squares with mean and variance adjustment (WLSMV) estimator. The single-factor CFA (CFI = 0.992; TLI = 0.984; RMSEA = 0.055 [90% CI = 0.028–0.083]; SRMR = 0.017) showed an excellent fit (based on the cutoffs proposed by Browne and Cudeck, 1992 and Hu and Bentler, 1998). An exploratory principle component analysis supported the unidimensional nature of the scale. Component loadings on the single component ranged from 0.697 to 0.857 for the five items. The single component explained 80.71% of the five items' total variance.

Instruments

Acceptance of Sugar Relationships in Older Men and Women Scale

The ASR-OMWS is the scale whose development, reliability analysis, and validation were the objectives of the present study. The item generation procedure was as presented previously (for the questionnaire, see Appendix 1), while the psychometric properties of the scale are discussed below. The scale contains five items. Cronbach's α values were 0.95 and 0.93 for the first and second samples, respectively.

Love Attitudes Scale, Short Form

The LAS-SF (Hendrick et al., 1998; adapted to Hungarian by Meskó et al., 2021) contains 24 items that compose the following six subscales: Eros (erotic, romantic, passionate love style), Ludus (game-playing love style), Storge (affectionate, friendship-oriented love style), Pragma (rational, shopping-list love style), Mania (possessive, dependent love style), and Agape (selfless love style). Each subscale has four items, and respondents indicate the extent to which each item applies to them on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Thus, higher scores reflect stronger identifications with specific love styles. Cronbach's α values for the six subscales were as follows: 0.83, 0.75, 0.85, 0.66, 0.73, and 0.84 for Eros, Ludus, Storge, Pragma, Mania, and Agape, respectively.

Sociosexual Orientation Inventory, Revised

The SOI-R (Penke and Asendorpf, 2008; adapted to Hungarian by Meskó et al., 2014) contains nine items assessing one's willingness to engage in uncommitted sexual encounters. The items compose three subscales measuring the three components of behavior, attitude, and desire. Responses are given on nine-point rating scales (scale anchors vary across items). Higher scores on each subscale indicate more unrestricted sociosexuality in terms of behavior, attitude, and desire. Cronbach's α values for the three subscales and the overall scale were as follows: 0.78, 0.82, 0.91, and 0.87 for behavior, attitude, and desire subscales and for the total score, respectively.

Reasons for Having Sex Questionnaire, Hungarian Short Form

The YSEX-HSF (Meskó et al., unpublished data) is a self-report instrument assessing sexual motivation. The scale comprises 73 items, which compose the following three subscales: Personal goal attainment, Relational reasons, and Sex as coping. Each item is rated on a five-point scale offering the following options: 1 = "None of my sexual experiences"; 2 = "Few (…)"; 3 = "Some (…)"; 4 = "Many (…)"; and 5 = "All of my sexual experiences." Thus, higher scores reflect higher levels of the measured sexual motive. Cronbach's α values were as follows:

0.91, 0.91, and 0.92 for personal goal attainment, relational reasons, and sex as coping, respectively.

Borderline Personality Inventory

The BPI (Leichsenring, 1999) is a 53-item self-report measure of borderline personality organization (BPO). Since the non-clinical sample of study 2 was expected to show relatively mild features of BPO, the original "yes-no" response format of the BPI was replaced with four-point rating scales (ranging from "never" to "always") more sensitive to subclinical intensity. Thus, BPI was used in a Likert scale format (for a previous application of this procedure, see Láng, 2015). The BPI measures four aspects of BPO: identity diffusion, fear of fusion, primitive defense mechanisms, and impaired reality testing. In this study, the total BPI score was used. BPI showed high internal consistency (Cronbach's $\alpha = 0.90$) as a unidimensional scale.

Short Dark Triad

The SD3 (Jones and Paulhus, 2014) is a 27-item self-report instrument. Its three subscales measure three socially aversive personality traits: Machiavellianism (e.g., "Generally speaking, people won't work hard unless they have to"), subclinical narcissism (e.g., "Many group activities tend to be dull without me"), and subclinical psychopathy (e.g., "It's true that I can be nasty"). Each subscale consists of nine items rated on a five-point Likert scale. Cronbach's α values were as follows: 0.79, 0.71, and 0.72 for Machiavellianism, Narcissism, and Psychopathy, respectively.

Results

Relationships between acceptance of sugar relationships and sexual motives, sociosexuality, and love styles were tested with Pearson's correlations. Results of these analyses along with the means and standard deviations of the variables are shown in Table 2. Acceptance of sugar relationships showed significant positive associations with all three sexual motives with all correlations being low to moderate in strength. This means that individuals with a more positive attitude toward sugar relationships tended to have sex out of self-focused reasons, and they also tended to use sex as a means of coping with distress or relational problems. Regarding sociosexuality, all subscales and the total score showed significant positive associations with the acceptance of sugar relationships. All correlations were moderate in strength. Accordingly, individuals with a more positive attitude toward sugar relationships were less restricted in sociosexual orientation and more willing to engage in sexual relationships without commitment. Concerning love styles, the acceptance of sugar relationships was significantly associated with Eros (negative correlation with negligible strength) and Ludus (weak positive correlation) love

styles. Acceptance of sugar relationships was unrelated to any of the Storge, Pragma, Mania, and Agape love styles. This means that individuals with a more positive attitude toward sugar relationships tended to see love as a source of pure pleasure without striving for exclusivity in their love relationships.

Table 2 *Pearson's correlations between acceptance of sugar relationships and sexual motivation, sociosexuality, and love attitudes (sample 1)*

		Correlation with ASR-YWMS (Birkás et al., 2020) (N = 319)	ASR-OMWS (current study) (N = 481)	Fisher's r-to-Z transformation	
		r	r	Z	p
YSEX?-HSF	Personal Goal Attainment	.457**	.482**	- .44	.660
	Relational Reasons	- .029	.225**	- 3.56	< .001
	Sex as Coping	.358**	.220**	2.08	.038
LAS-SF	Eros	-.267**	- .193**	- 1.08	.280
	Ludus	.543**	.540**	.06	.952
	Storge	- .016	.005	- .29	.772
	Pragma	- .010	-.002	- .11	.912
	Mania	.116	.078	.53	.596
	Agape	- .154*	- .034	- 1.67	.095
SOI-R	Behavior	.438**	.418**	.34	.734
	Attitude	.396**	.465**	- 1.17	.242
	Desire	.459**	.466**	- .12	.905
	Total	.529**	.555**	- .51	.610

Note: * $p < .01$, ** $p < .001$ for correlations. ASR-OMWS = Acceptance of Sugar Relationship in Older Men and Women Scale. YSEX?-HSF = Why Have Sex - Hungarian Short Form. SOI-R = Sociosexual Orientation Inventory Revised. LAS-SF = Love Attitude Scale - Short Form.

Next, we compared the strength of the correlations with that obtained in the study of Birkás et al. (2020) that tested the same associations in a young adult sample. According to the results of Fisher *r*-to-*Z* transformations (i.e., statistical analyses that test whether two correlation coefficients are significantly different from each other; Table 2), acceptance of sugar relationships correlated significantly stronger with relational reasons as sexual motives and significantly weaker with sex as coping in the current older sample. All other correlations were statistically identical in strength.

Associations between acceptance of sugar relationships and personality traits were tested with Pearson's correlations. The results (Table 3) revealed significant positive moderate associations between the acceptance of sugar relationships and all four personality traits. Thus, participants with a more positive attitude toward sugar relationships reported more pronounced narcissistic (weak correlation), Machiavellian and psychopathic traits (moderately strong correlations), and more pronounced signs of BPO (weak correlation).

Table 3 *Pearson's correlations between acceptance of sugar relationships and personality traits (Sample 2)*

	Correlation with ASR-YWMS (Birkas et al., 2020) (N = 1733)	Correlation with ASR-OMWS (current study) (N = 355)	Fisher's r-to-Z transformation	
	r	r	Z	p
BPI	.267	.211	1.02	.308
Mach	.351	.459	- 2.21	.027
Psych	.349	.490	- 2.94	.003
Narc	.191	.213	- .39	.697

Note: all correlations are significant at the level of $p < .001$. ASR-YWMS = Acceptance of Sugar Relationship in Younger Women and Men Scale, ASR-OMWS = Acceptance of Sugar Relationship in Older Men and Women Scale. Mach = Machiavellianism, Psych = subclinical psychopathy, Narc = subclinical narcissism, BPI = Borderline Personality Inventory.

Next, we compared the strength of the correlations to that obtained in the study of Birkás et al. (2020) that tested the same associations in a young adult sample. According to the results of Fisher *r*-to-*Z* transformations, the associations of acceptance of sugar relationships with Machiavellianism and psychopathy were significantly stronger in the current older sample. All other correlations were statistically identical in strength.

Discussion

The present study evaluated a self-report measure regarding the acceptance of sugar relationships in older adults. Compared with the mating strategies of young adults, there is much less known about the partner preferences of individuals in older ages. Accordingly, this is the first empirical test of the correlates of attitudes toward sugar relationships in a predominantly evolutionary approach in a sample beyond young adulthood.

Moreover, the ASR-OMWS was used to test the association between personality characteristics, relational attitudes, and attitudes toward sugar relationships in older adults. More

accepting individuals can be characterized not only by a more instrumental motivation toward sex but also by respecting the relational aspect of the sugar relationship.

This might suggest that intimacy could also be a product or service that is desired and valued by older individuals (Alterovitz and Mendelsohn, 2011; Fales et al., 2016). Furthermore, older adults scoring high on ASR-OMWS preferred relationships offering fun and taking advantage of partners and were less interested in romantic and emotional love (see section "Results" for love styles). More unrestricted sociosexuality was also positively associated with the acceptance of sugar relationships showing, that despite of their older age and declining mate value, individuals willing to take part in a sugar relationship are sexually more active. These love and sexual motives might play a key role in shaping the mating strategies of older adults. Elevated sexual impulses increase the focus on the physical characteristics of the potential partner and put more value on these signs. Since older adults possess rather material resources than physical appeal, sugar relationships might represent an undertakable and accessible form of affair (e.g., Jonason and Kavanagh, 2010; Allen and Desille, 2017; Træen et al., 2019).

On the personality level, acceptance of sugar relationships was positively associated with socially aversive personality traits (i.e., Dark Triad) and BPO. This suggests that to some extent, partner preferences of older adults are affected by these personality traits. As pointed out earlier, personality affects both advertised and expected partner qualities. Thus, it forms the nature of the desirable relationship. Connecting our results with previous findings regarding the mating strategies of the Dark Triad and BPO, sugar relationship appears to be endorsed by individuals preferring short-term sexual relationships with less commitment and intimacy (e.g., Jonason et al., 2009, 2019; Lavner et al., 2015; Muñoz Centifanti et al., 2016; Birkás et al., 2018).

The question may arise as to why these psychologies are so similar (i.e., openness to offer sexual companionship in exchange for resources or openness to offer resources in exchange for sex). The provision of resources by males to the sexual partner (not specifically in exchange for sex) is an adaptive behavior that plays an important role in the functioning of long-term, emotionally committed relationships, especially in the care of offspring (Buss and Schmitt, 1993, 2019; Conroy Beam and Buss, 2019; Luberti et al., 2020). Therefore, the sensitivity of females to resources in the mating context is also an adaptive trait that may have contributed to their reproductive success in the past. However, direct sexual transaction, free from commitment and mutual reproductive goals, is part of a short-term-focused mating strategy (Anderson and Klofstad, 2012; Whyte et al., 2019; Buss et al., 2020). The psychological characteristics of this strategy, which exploits herself/himself and others, are very similar from both the supply and

demand sides: to get as many benefits as possible in the shortest possible time, without considering the possible long-term consequences.

Our study has some limitations as well. Perhaps, the sample is biased due to the possibility that individuals with an increased interest in sex-related topics can be overrepresented in our sample, leading to an increased openness toward sugar relationships. Moreover, the majority of the participants had no direct experience with sugar relationships, and accordingly, their attitudes might be more biased by their personality or impulses. Still, our findings are in line with the prequel to this study (Birkás et al., 2020) showing that older adults who are accepting toward sugar relationships have similar motives and personality traits as young adults who are willing to engage in transactional sex. The most prominent difference between the results obtained from the two studies (i.e., Birkás et al., 2020 and the current study) was that acceptance of sugar relationships was weakly but significantly positively associated with relational motives for having sex in the current study with older sample. Thus, a more direct comparison of age-groups and/or inclusion of behavioral measures might be a fruitful direction of future research.

Data Availability Statement

The datasets generated for this study are available on request to the corresponding author.

Ethics Statement

The studies involving human participants were reviewed and approved by the Hungarian United Ethical Review Committee (http://epkeb.ttk.hu/). The patients/participants provided their written informed consent to participate in this study.

Author Contributions

NM, AL, and BB: conceptualization. NM and DI: methodology and writing (review and editing). AL and AZ: formal analysis and investigation. AL and BB: writing (original draft preparation). AL and NM: funding acquisition and resources. NM: supervision. All authors contributed to the article and approved the submitted version.

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Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Footnotes

1. https://index.hu/

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Appendix 1

Acceptance of Sugar Relationship in Older Men and Women Scale (ASR-OMWS)

A sugar relationship is a transactional sexual relationship in which an older and wealthier partner (sugar daddy/mommy) provides material resources to a younger partner (sugar baby/boy) in return for her or his companionship. Partners usually meet to spend leisure time together, and sexual activity is only involved if both partners give their consent.

Please indicate the extent to which you agree with each of the below statements using the seven-point rating scales ranging from (1) “absolutely disagree” to (7) “absolutely agree”.

absolutely disagree						absolutely agree
1	2	3	4	5	6	7

1. A sugar relationship is a good thing because it can help people feel better.	1 2 3 4 5 6 7
2. In the future, I could end up engaging in a sugar relationship.	1 2 3 4 5 6 7
3. If I knew I would not incur negative judgment or consequences, I would like to try a sugar relationship.	1 2 3 4 5 6 7
4. If it would be beneficial for my sex life or for others’ judgment of me, I would consider engaging in a sugar relationship.	1 2 3 4 5 6 7
5. I would seriously consider engaging in a sugar relationship if that was the way to find a partner who would meet all my needs.	1 2 3 4 5 6 7

3.3 Attachment Avoidance Moderates the Relationship Among Acceptance of Sugar Relationships, Motivation, and Self-Esteem[10]

Dóra Ipolyi[1], Edit Csányi[1], András Láng[1], Norbert Meskó[1*]

[1] Institute of Psychology, University of Pécs, Pécs, Hungary

* Corresponding author

Abstract

A sugar relationship is a monetary-based liaison between a wealthier older and an attractive younger person, the latter receiving expensive gifts or financial compensation in exchange for her or his sexual companionship. Attachment, motivation, and self-esteem are all integrative parts of adult romantic and sexual relationships. There is relatively little empirical research on the psychological correlates of accepting attitudes toward sugar relationships. The research aimed to explore the relationship among the acceptance of sugar relationship, attachment (avoidance and anxiety), motivation (extrinsic and intrinsic), and self-esteem. A total of 2,409 Hungarian adults including 1,980 younger participants (1,804 women, 175 men, mean age = 21.17) and 429 older participants (290 men, 138 women, mean age = 48.86) completed an online test battery comprising four self-report measures. In the younger subsample, the only significant association obtained for the acceptance of sugar relationships was its positive correlation with extrinsic motivation. In the older subsample, the acceptance of sugar relationships was positively correlated with all tested variables except self-esteem. Subsequent analysis revealed that attachment avoidance but not anxiety moderated the associations between the variables. Among younger participants, the negative effect of self-esteem and intrinsic motivation on accepting sugar relationships decreased with increasing attachment avoidance. Among older participants, the positive effect of extrinsic motivation on accepting sugar relationships decreased with increasing attachment avoidance. The results are discussed with regard to relational and sexual goals associated with adult attachment orientations.

Keywords: acceptance of sugar relationships, adult attachment, self-esteem, motivation, transactional sex.

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Theoretical Background

Sugar Relationship

Transactional sex includes specific forms of sexual relationship based on an exchange of sexual companionship and material support or other benefits. A sugar relationship is a modern form of transactional sexual relationship, in which a younger partner (sugar baby/boy) receives material compensation from an older and wealthier partner (sugar daddy/mommy) in return for her or his companionship (Nayar, 2016). The majority of studies on the psychology of sugar relationships focus on the younger partners (e.g., Hoss and Blokland, 2018) in terms of their personality traits (e.g., Blum et al., 2018) and the support provided by their parents (e.g., Betzer et al., 2015). In a recent study, the acceptance attitude of young participants toward engaging in sugar relationships was positively related to a game-playing love style, egoistic sexual motivation, a more unrestricted sociosexual orientation, and socially aversive personality traits, such as Machiavellianism, subclinical psychopathy, and borderline personality organization (Birkás et al., 2020). Much fewer studies focus on the older (and wealthier) partners in sugar relationships, partly due to difficulties with sampling individuals currently or previously involved in a sugar relationship (Betzer et al., 2015). Recently, Láng et al. (2021) developed an attitude scale to assess the acceptance of sugar relationships by older women and men. The authors found that higher acceptance of sugar relationships was associated with more unrestricted sociosexuality, higher preference for engaging in playful love relationships, higher self-focused sexual motivation, and more pronounced Dark Triad, and borderline traits. Both Birkás et al. (2020) and Láng et al. (2021) revealed that older adults reporting an accepting attitude toward sugar relationships had sexual motives and personality traits similar to those of younger adults who reported willingness to engage in transactional sex.

Motivation

Aspirations are long-term goals manifested in behaviors varying across individuals and situations (Kasser and Ryan, 1993,1996). These goals and the underlying motives have a dual nature. Intrinsically motivated aspirations serve the psychological needs of oneself (e.g., self-acceptance, personal development, social relationships, a sense of communion, and physical health), while extrinsically motivated aspirations are aimed at rewards provided by the external environment (e.g., financial and social success, reputation, and physical attractiveness; Kim et al., 2003).

Intrinsic motivation is more closely associated with general well-being, satisfaction with life, happiness, and balanced sex life, whereas extrinsic motivation is primarily related to

immediate rewards, tangible benefits, and short-term need satisfaction. Extrinsic motivation shows a negative or no association with well-being, while it is positively related to low self-esteem, addictions, and poor social and sexual relationships (Rijavec et al., 2006). External regulation of sex life is the least autonomous type of extrinsic motivation, where one engages in sexual activity to avoid conflict or punishment or to gain benefits. Externally regulated sexual behavior is not consistent with one's self. On contrary, intrinsic regulation is the most autonomous type of sexual motivation, in which case the actions of an individual are fully consistent with the will of an individual (Gravel et al., 2016).

The acceptance of sugar relationships showed a positive relationship with Machiavellianism to both younger (Birkás et al., 2020) and older adults (Láng et al., 2021). Since, as McHoskey (1999) points out, Machiavellians are primarily driven by external rewards (e.g., status, resources), rather than intrinsic motives (e.g., community, family, and romantic love), the acceptance of sugar relationships is likely to be related to the extrinsic-intrinsic dimensions of motivation.

Attachment

According to Hazan and Shaver (1987), early infant-caregiver attachment forms the basis of attachment patterns in intimate partner relationships of adults, in which the partner replaces the caregiver as the attachment figure. Both infant and adult attachment shows three typical patterns including the secure, anxious, and avoidant styles (Bartholomew and Horowitz, 1991); however, while infant attachment to the caregiver is an asymmetrical, dependency-based, and non-sexual relationship, adult attachment, normally, is symmetrical and reciprocal, and it involves sexuality (Hazan and Zeifman, 1994).

In intimate partner relationships, the secure vs. insecure (anxious or avoidant) attachment style of an individual has a decisive impact on attitudes of an individual toward that partner and characteristic modes of an individual of coping with relationship problems. Securely attached adults showed relatively low levels of anxiety and avoidance, which were associated with supportive and accepting attitudes toward their partners and with high levels of relationship satisfaction, whereas, insecurely attached adults had less positive social experiences and more difficulties with approaching others, and they were less satisfied with their intimate partner relationships (Vicary and Fraley, 2009). Those with an anxious attachment style were prone to engage in casual sexual encounters lacking intimate interactions and adequate need for fulfillment, while those characterized by avoidance attachment tended to engage in emotionally detached sexual relationships (Hazan and Shaver, 1987). Potard et al. (2014) found that women who had avoidance attachment with their fathers during childhood had difficulties with sexual

choices in adulthood. On the contrary, their securely attached counterparts had fewer, more emotionally balanced, intimate, and satisfying sexual relationships (Birnbaum et al., 2006).

Fraley and Shaver (2000) suggest that individuals regulate their attachment behavior by setting a subjectively optimal level of avoidance, that is, emotional distance from the attachment figure, whose discrepancy from the currently perceived distance elicits anxiety in them.

Self-Esteem

Self-esteem is the evaluative component of the self-concept, which is reflected in feelings about important things of an individual, and treatment of oneself (Rosenberg et al., 1995). Self-esteem may also be defined as a type of sociometer, which enables one to appraise the subjective value of members of an important or desirable group (Sowislo and Orth, 2012). Several theoretical models propose that self-esteem is a pervasive human motive, which generally serves adaptive behavior and contributes to favorable outcomes for the individual (Pyszczynski et al., 2004). This approach has led to the pragmatic assumption that people are motivated to maintain high self-esteem. As Baumeister et al. (2003) point out, however, subjective experiences may result in fluctuations of self-esteem: achieving significant success (e.g., winning in a competition, solving a problem, attaining a goal) seems to be associated with increased state self-esteem, while failures are related to temporary decreases in self-esteem. Low self-esteem emerging in adolescence is a risk factor for subsequent mental and physical health conditions, poor financial prospects, and criminal conduct (Trzesniewski et al., 2006), and for an early start of sex life, high-risk sexual activity, and a large number of sexual partners (Ethier et al., 2006).

Aims of Research

In consistence with the theoretical background discussed, the acceptance of sugar relationships was expected to be positively associated with extrinsic rather than intrinsic motivation and with avoidance rather than an anxious attachment. In the absence of relevant previous findings, no specific prediction was made for its association with self-esteem. To the best of our knowledge, the present study is the first to explore the psychological correlations of the acceptance of sugar relationships.

Method

Sample and Procedure

The overall sample (N = 2,409) comprised a younger and an older subsample (n = 1,980 and 429, respectively). The younger subsample included 175 males and 1,804 females (one participant did not indicate their gender) aged between 18 to 27 years (M = 21.17 and SD =

2.91). The older subsample included 290 men and 138 women (one participant did not indicate their gender) aged between 40 to 71 years (M = 48.86 and SD = 7.33).

Data were collected online. The survey was edited in Google forms. The link to the survey was disseminated *via* Facebook and one of the most popular and influential Hungarian Internet portals, Index (https://index.hu). All participants gave their written informed consent, and none of them was rewarded for participation. The research plan received ethical approval from the Hungarian United Ethical Review Committee for Research in Psychology (Ref. No. 2018/115).

Measures

The Acceptance of Sugar Relationships in Young Women and Men Scale (ASR-YWMS)

The ASR-YWMS (Birkás et al., 2020) comprises five items assessing the willingness in oneself to engage in sugar relationships as the younger partner (potential sugar baby/boy) provides her/his sexual companionship for the older partner in return for gifts and/or monetary compensation. The participants rated each item on a 5-point scale ranging from 1 indicating extreme rejection (e.g., absolutely disagree) to 5 indicating extreme acceptance (e.g., absolutely agree). In the present study, the ASR-YWMS showed adequate internal consistency (Cronbach's α = 0.940).

The Acceptance of Sugar Relationships in Older Men and Women Scale (ASR-OMWS)

The ASR-OMWS (Láng et al., 2021) comprises five items assessing the willingness in oneself to engage in sugar relationships as the older partner (potential sugar daddy/mommy) provides gifts and/or monetary compensation for the younger partner in return for her/his sexual companionship. The participants rated each item on a 5-point scale ranging from 1 indicating extreme rejection (e.g., *absolutely disagree*) to 5 indicating extreme acceptance (e.g., *absolutely agree*). The scale showed adequate internal consistency (Cronbach's α = 0.939).

Relationship Structures of Experiences in Close Relationships (ECR-RS)

The ECR-RS scale (Fraley et al., 2011; Hungarian adaptation by Jantek and Vargha, 2016) assesses anxious and avoidance attachment styles with a total of nine items concerning the close relationships with the respondent in general. Participants rated each item on a 7-point scale ranging from *strongly disagree* (1) to *strongly agree* (7). A mean score was computed for each of the avoidance and anxiety subscales. Higher scores on each subscale indicated higher attachment insecurity. Both subscales showed adequate internal consistency (α = 0.864 and 0.892, respectively).

Rosenberg Self-Esteem Scale (RSES)

The Hungarian version of the 10-item RSES-H (RSES, Rosenberg, 1965; Hungarian adaptation by Sallay et al., 2014) provides a measure of global self-esteem. The participants rated

their agreement with each item on a 4-point scale ranging from *strongly disagree* (0) to *strongly agree* (3). Higher scores indicated higher global self-esteem. The scale showed adequate internal consistency (Cronbach's α = 0.920).

Aspiration Index

The AI (Kasser and Ryan, 1996; Hungarian adaptation by Martos et al., 2006) assesses personal aspirations defined as long-term overall goals, which indicate the basic direction of the life of the respondent. The Likert scale comprises two subscales measuring intrinsically motivated aspirations (e.g., meaningful social relationships, personal growth, and commitment to the community) and extrinsically motivated aspirations (e.g., wealth, reputation, and attractive appearance). Both intrinsic aspirations and extrinsic aspirations showed adequate internal consistency (α = 0.722 and 0.823, respectively).

Results

We used Pearson's correlations to test the associations between measured variables. The results are presented for both age groups separately. For younger participants (Table 1), the acceptance of sugar relationships showed significant correlations with all measured variables; however, the strengths of correlations were negligible (i.e., $r < |0.2|$; Ferguson, 2009) except for extrinsic motivation ($r = 0.279$; $p < 0.001$). A more accepting attitude toward sugar relationships was associated with more intense extrinsic motivation.

Table 1 *Associations of measured variables with the acceptance of sugar relationships; the results of Pearson's correlations for the younger subsample (n = 1,980)*

	ASR-YWMS	ECR-RS AV	ECR-RS AX	RSES	AI-I
ECR-RS AV	.151***				
ECR-RS AX	.179***	.289***			
RSES	- .082***	- .281***	- .510***		
AI-I	- .171***	- .293***	.017	.050*	
AI-E	.279***	- .046*	.128***	.056*	.145***

Note: * p < .05; ** p < .01; *** p < .001. ASR-YWMS = Acceptance of Sugar Relationships in Young Women and Men Scale; ECR-RS AV = Experiences in Close Relationships – Relationship Structures Scale attachment avoidance dimension; ECR-RS AX = Experiences in Close Relationships – Relationship Structures Scale attachment anxiety dimension; RSES = Rosenberg Self-Esteem Scale; AI-I = Aspirations Index – Intrinsic; AI-E = Aspirations Index – Extrinsic.

For older participants (Table 2), the acceptance of sugar relationships showed significant associations with all measured variables except for self-esteem ($r = -0.045$; $p = 0.356$).

Attachment avoidance (r = 0.300; p < 0.001), attachment anxiety (r = 0.252; p < 0.001), and extrinsic motivation (r = 0.302; p < 0.001) showed positive correlations with the acceptance of sugar relationships with weak to moderate strength. Intrinsic motivation was negatively correlated with the acceptance of sugar relationships with weak strength (r = −0.270; p < 0.001). Thus, a more accepting attitude toward sugar relationships was associated with higher fear of both intimacy and separation, more intense extrinsic and less intense intrinsic motivations.

Table 2 *Associations of measured variables; the results of Pearson's correlations for the older subsample (n = 429)*

	ASR-OMWS	ECR-RS AV	ECR-RS AX	RSES	AI-I
ECR-RS AV	.300***				
ECR-RS AX	.252***	.293***			
RSES	- .045	- .223***	- .435***		
AI-I	- .270***	- .346***	- .170***	.261***	
AI-E	.302***	.021	.110*	.044	.099*

Note: * p < .05; ** p < .01; *** p < .001. ASR-OMWS = Acceptance of Sugar Relationships in Older Men and Women Scale; ECR-RS AV = Experiences in Close Relationships – Relationship Structures Scale attachment avoidance dimension; ECR-RS AX = Experiences in Close Relationships – Relationship Structures Scale attachment anxiety dimension; RSES = Rosenberg Self-Esteem Scale; AI-I = Aspirations Index – Intrinsic; AI-E = Aspirations Index – Extrinsic.

Next, we tested the moderation effect of attachment anxiety and attachment avoidance on the relationship between self-esteem, motivation (both intrinsic and extrinsic), and the acceptance of sugar relationships. Moderation analyses were run with PROCESS 3.1. (Hayes, 2018). A total of 12 moderation analyses were run (6–6 for both subsamples). The results are summarized in Tables 3, 4. For the younger subsample (Table 3), attachment anxiety had no significant moderation effect. Attachment avoidance moderated the self-esteem to the effect of the acceptance of sugar relationships. Estimated effects of self-esteem on the acceptance of sugar relationships were −0.13 (p< 0.001), −0.07 (p = 0.017), and 0.02 (p = 0.541) at 1 SD below mean, mean, and 1 SD above mean values of attachment avoidance. Thus, with the increase in attachment avoidance, the negative effect of self-esteem on the acceptance of sugar relationships waned and disappeared. Attachment avoidance also moderated the intrinsic motivation to the acceptance of sugar relationships effect. Estimated effects of intrinsic motivation on the acceptance of sugar relationships were −0.28 (p = 0.013), −0.42 (p < 0.001), and −0.60 (p < 0.001) at 1 SD below mean, mean, and 1 SD above mean values of attachment avoidance.

Thus, with the increase in attachment avoidance, the negative effect of intrinsic motivation on the acceptance of sugar relationships increased in strength.

Table 3 *Mediation effects of attachment avoidance and attachment anxiety on the self-esteem/motivation to the effect of the acceptance of sugar relationships in younger participants (n = 1,980); unstandardized coefficients*

Independent variable (X)	X	M	X x M interaction
Mediator (M) = ECR-RS AV			
RSES	- 0.217***	- 0.116	0.011**
AI-I	- 0.098	0.752**	- 0.023*
AI-E	0.549***	0.156	0.002
Mediator (M) = ECR-RS AX			
RSES	- 0.045	0.135	0.005
AI-I	- 0.398*	0.816*	- 0.020
AI-E	0.398***	- 0.020	0.012

Note: * p < .05; ** p < .01; *** p < .001. Acceptance of Sugar Relationships in Young Women and Men Scale is the dependent variable in all cases. ECR-RS AV = Experiences in Close Relationships – Relationship Structures Scale attachment avoidance dimension; ECR-RS AX = Experiences in Close Relationships – Relationship Structures Scale attachment anxiety dimension; RSES = Rosenberg Self-Esteem Scale; AI-I = Aspirations Index – Intrinsic; AI-E = Aspirations Index – Extrinsic.

For the older subsample (Table 4), only one significant moderation effect was found. Attachment avoidance moderated the extrinsic motivation to the acceptance of sugar relationships effect. Estimated effects of extrinsic motivation on the acceptance of sugar relationships were 1.05 ($p < 0.001$), 0.81 ($p < 0.001$), and 0.55 ($p < 0.001$) at 1 SD below mean, mean, and 1 SD above mean values of attachment avoidance. Thus, with the increase in attachment avoidance, the positive effect of extrinsic motivation on the acceptance of sugar relationships decreased in strength.

Discussion

The present study explored the psychological correlates of attitudes of younger (potential sugar babies/boys) and older individuals (potential sugar daddies/mommies) toward sugar relationships. To the best of our knowledge, this study is the first to have explored the associations of the acceptance of sugar relationships with extrinsic and intrinsic motivation, self-esteem, and attachment anxiety and avoidance.

Table 4 *Mediation effects of attachment avoidance and attachment anxiety on the self-esteem/motivation to effect of the acceptance of sugar relationships in older participants (n = 429); unstandardized coefficients*

Independent variable (X)	X	M	X x M interaction
Mediator (M) = ECR-RS AV			
RSES	- 0.089	0.163	0.007
AI-I	- 1.055**	- 0.243	0.021
AI-E	1.312***	0.922***	- 0.294*
Mediator (M) = ECR-RS AX			
RSES	0.134	0.564	0.002
AI-I	- 1.152***	- 0.631	0.043
AI-E	1.081***	1.256**	- 0.042

Note: * p < .05; ** p < .01; *** p < .001. Acceptance of Sugar Relationships in Older Men and Women Scale is the dependent variable in all cases. ECR-RS AV = Experiences in Close Relationships – Relationship Structures Scale attachment avoidance dimension; ECR-RS AX = Experiences in Close Relationships – Relationship Structures Scale attachment anxiety dimension; RSES = Rosenberg Self-Esteem Scale; AI-I = Aspirations Index – Intrinsic; AI-E = Aspirations Index – Extrinsic.

In the younger subsample, the acceptance of sugar relationships only showed an association of considerable magnitude with extrinsic motivation. In the older subsample, by contrast, the acceptance of sugar relationships was meaningfully associated with all tested variables except self-esteem. Positive correlations were found for attachment avoidance, attachment anxiety, and extrinsic motivation, while intrinsic motivation was negatively correlated with the acceptance of sugar relationships. Overall, higher acceptance of sugar relationships was associated with a more intense fear of both intimacy and separation, higher levels of extrinsic motivation, and lower levels of intrinsic motivation. These results are in part consistent with related previous findings revealing positive associations of insecure attachment with pretended orgasm reported by women (Láng et al., 2020), vibrator use, anal sex (Costa and Brody, 2011), and sexual addictions in men (Zapf et al., 2008).

The results of the moderation analyses showed that attachment anxiety of younger participants did not have a significant moderating effect on their self-esteem, intrinsic motivation, extrinsic motivation, or the acceptance of sugar relationships; however, attachment avoidance moderated the effect of self-esteem on the acceptance of sugar relationships, that is, the negative effect of self-esteem decreased to zero with increasing attachment avoidance. These observations are consistent with certain findings obtained in previous studies. For example, as

compared to the low self-esteem associated with anxious attachment, in general (Campbell and Marshall, 2011), the higher levels of self-esteem reported by avoidance attached individuals probably reflect maladaptive narcissism. Smolewska and Dion (2005) found that covert narcissism was better predicted by attachment avoidance than by attachment anxiety.

Furthermore, attachment avoidance moderated the negative effect of intrinsic motivation on the acceptance of sugar relationships, that is, the effect of intrinsic motivation decreased with increasing attachment avoidance. This finding is in line with the observation that intrinsic motivation is an essential part of self-concept of oneself (Ryan and Deci, 2017), which is primarily associated with preference for a sexual relationship based on mutual emotional commitment rather than for sex in return for material compensation (Birkás et al., 2020; Láng et al., 2021); however, intrinsically motivated sexual activity appears to be severely inhibited in those insecurely attached individuals who tend to avoid intimate relationships.

In the older subsample, attachment avoidance moderated the positive effect of extrinsic motivation on the acceptance of sugar relationships, that is, the effect of extrinsic motivation decreased with increasing attachment avoidance. This finding deserves particular attention, given that the observed effect of attachment avoidance is contrary to that found in the younger participants. High extrinsic motivation combined with low attachment avoidance is more likely to be satisfied by attaining social goals (e.g., achieving admiration or respect of others), thus, it is more consistent with engaging in a sugar relationship, in which a young and attractive partner may enhance the impression made by the older partner on their social environment. On the other hand, high attachment avoidance is more likely to be associated with highly egocentric satisfaction of extrinsic motives (e.g., accumulating material assets), which is less consistent with investing in a sugar relationship. These explanatory hypotheses should be tested in future studies possibly utilizing the full version of the AI. Further studies could also profit from using RSES as a two-component measure (e.g., Tafarodi and Milne, 2002; Dessí and Zhao, 2018).

Some limitations of the study must be also acknowledged. Given its correlational, cross-sectional design, causal inferences are hypothetical. Thus, further studies should use longitudinal or follow-up designs to gather data that are more appropriate for making causal inferences. Another limitation of the study is theoretical. Adult attachment theory (Hazan and Shaver, 1987) and the model used in this study (Bartholomew and Horowitz, 1991) could be culturally biased. We deemed adult attachment theory as an appropriate theoretical framework since the sample consisted of individuals living in a Western society with access to the internet; however, these results and discussion should be handled with caution in non-Western societies, given the fact that attachment theory might overclaim universality (e.g., Keller, 2018).

Data Availability Statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics Statement

The studies involving human participants were reviewed and approved by Hungarian United Ethical Review Committee. The patients/participants provided their written informed consent to participate in this study.

Author Contributions

DI: methodology, writing original draft, and funding acquisition. EC: data collection, writing original draft, and funding acquisition. AL: formal analysis and investigation. NM: conceptualization, data collection, review and editing manuscript, and supervision. All authors contributed to the article and approved the submitted version.

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Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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3.4 Exploring Attitudes Toward "Sugar Relationships" Across 87 Countries: A Global Perspective on Exchanges of Resources for Sex and Companionship[11]

Norbert Meskó[1*], Marta Kowal[2], András Láng[1], Ferenc Kocsor[1], Szabolcs A. Bandi[1], Adam Putz[1], Piotr Sorokowski[3], David A. Frederick[4], Felipe E. García[5], Leonardo A. Aguilar[6], Anna Studzinska[7], Chee-Seng Tan[8], Biljana Gjoneska[9], Taciano L. Milfont[10], Merve Topcu Bulut[11], Dmitry Grigoryev[12], Toivo Aavik[13], Mahmoud Boussena[14], Alan D. A. Mattiassi[15], Reza Afhami[16], Rizwana Amin[17], Roberto Baiocco[18], Hamdaoui Brahim[19], Ali R. Can[20], Joao Carneiro[21], Hakan Çetinkaya[22], Dimitri Chubinidze[23], Eliane Deschrijver[24,25,26], Yahya Don[27], Dmitrii Dubrov[28], Izzet Duyar[29], Marija Jovic[30], Julia A. Kamburidis[31], Farah Khan[32], Hareesol Khun-Inkeeree[33], Maida Koso-Drljevic[34], David Lacko[35], Karlijn Massar[36], Mara Morelli[37], Jean C. Natividade[38], Ellen K. Nyhus[39], Ju Hee Park[40], Farid Pazhoohi[41], Ekaterine Pirtskhalava[42], Koen Ponnet[43], Pavol Prokop[44,45], Dušana Šakan[46], Singha Tulyakul[47],Austin H. Wang[48], Sibele D. Aquino[38], Derya D. Atamtürk[29], Nana Burduli[49], Antonio Chirumbolo[50], Seda Dural[51], Edgardo Etchezahar[52,53], Nasim Ghahraman Moharrampour[54], Balazs Aczel[55], Luca Kozma[1,56], Samuel Lins[57], Efisio Manunta[58], Tiago Marot[59], Moises Mebarak[60], Kirill G. Miroshnik[61], Katarina Misetic[34], Marietta Papadatou-Pastou[62], Bence Bakos[63], Fatima Zahra Sahli[64], Sangeeta Singh[39], Çağlar Solak[65], Tatiana Volkodav[66], Anna Wlodarczyk[67], Grace Akello[68], Marios Argyrides[69], Ogeday Çoker[70], Katarzyna Galasinska[71], Talía Gómez Yepes[72], Aleksander Kobylarek[73], Miguel Landa-Blanco[74], Marlon Mayorga[75], Barış Özener[29], Ma. Criselda T. Pacquing[76], Marc Eric S. Reyes[76], Ayşegül Şahin[28], William Tamayo-Agudelo[77], Gulmira Topanova[78], Ezgi Toplu-Demirtaş[79], Belgüzar N. Türkan[70], Marcos Zumárraga-Espinosa[80], Simone Grassini[81,82], Jan Antfolk[83], Clément Cornec[84], Katarzyna Pisanski[3,84], Sabrina Stöckli[85], Stephanie Josephine Eder[86], Hyemin Han[87]

* Corresponding author

[1] Institute of Psychology, University of Pécs, Pecs, Hungary
[2] IDN Human Being Lab, University of Wrocław, Wrocław, Poland
[3] Institute of Psychology, University of Wrocław, Wrocław, Poland
[4] Crean College of Health and Behavioral Sciences, Chapman University, Orange, CA, USA
[5] Departamento de Psiquiatría y Salud Mental, Facultad de Medicina, Universidad de Concepción, Concepción, Chile
[6] School of Psychology, Central University of Venezuela, Caracas, Venezuela
[7] Departament of Humanities, Icam, Toulouse, France
[8] Department of Psychology and Counselling, Universiti Tunku Abdul Rahman, Kampar, Malaysia
[9] Macedonian Academy of Sciences and Arts, Skopje, North Macedonia
[10] School of Psychology, University of Waikato, Tauranga, New Zealand
[11] Clinical Addiction Research Unit, Lund University, Malmö, Sweden
[12] Center for Sociocultural Research, HSE University, Moscow, Russian Federation
[13] Institute of Psychology, University of Tartu, Tartu, Estonia
[14] Departement of Psychology and Educational Sciences, Mohamed Lamine Debaghine, University Setif2, Setif, Algeria

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[15] Department of Education, Languages, Interculture, Literatures and Psychology, University of Florence, Florence, Italy
[16] Department of Art Studies, Tarbiat Modares University, Tehran, Iran
[17] Department of Professional Psychology, Bahria University, Islamabad, Pakistan
[18] Department of Developmental and Social Psychology, Sapienza University of Rome, Rome, Italy
[19] Idepartment of Sociologie, University of Ibn Tofail, Kenitra, Morocco
[20] Department of Anthropology, Hatay Mustafa Kemal University, Hatay, Turkey
[21] Department of Social Psychology, University of Porto, Porto, Portugal
[22] Department of Psychology, Yaşar University, İzmir, Turkey
[23] Psychological Set Research and Correction Center, Tbilisi
State Medical University, Tbilisi, Georgia
[24] Department of Experimental Psychology, Ghent University, Ghent, Belgium
[25] School of Psychology, University of New South Wales, Sydney, Australia
[26] School of Psychology, University of Sydney, Sydney, Australia
[27] School of Education, Universiti Utara Malaysia, Kedah, Malaysia
[28] HSE University, Moscow, Russian Federation
[29] Department of Anthropology, Istanbul University, Istanbul, Turkey
[30] Department of Marketing Management and Public Relations, Faculty of Organizational Sciences, University of Belgrade, Belgrade, Serbia
[31] Department of General, Experimental and Genetic Psychology, Sofia University, Sofia, Bulgaria
[32] Institute of Education & Research, Women University Mardan, Mardan, Pakistan
[33] Psychology and Counselling, Prince of Songkla University, Pattani, Thailand
[34] Department of Psychology, University of Sarajevo, Sarajevo, Bosnia and Herzegovina
[35] Interdisciplinary Research Team on Internet and Society, Faculty of Social Studies, Masaryk University, Brno, Czech Republic
[36] Work and Social Psychology, Maastricht University, Maastricht, The Netherlands
[37] Department of Dynamic and Clinical Psychology, and Health Studies, Sapienza University of Rome, Rome, Italy
[38] Department of Psychology, Pontifical Catholic University of Rio de Janeiro, Rio de Janeiro, Brazil
[39] Department of Management, University of Agder, Kristiansand, Norway
[40] Department of Child and Family Studies, Yonsei University, Seoul, Korea
[41] Department of Psychology, University of British Columbia, Vancouver, Canada
[42] Department of Psychology, Ivane Javakhishvili Tbilisi State University, Tbilisi, Georgia
[43] Faculty of Social Sciences, Imec-Mict-Ghent University, Ghent, Belgium
[44] Department of Environmental Ecology and Landscape Management, Comenius University, Bratislava, Slovakia
[45] Institute of Zoology, Slovak Academy of Sciences, Bratislava, Slovakia
[46] Department of Psychology, Faculty of Legal and Business Studies Dr Lazar Vrkatić, Union University, Novi Sad, Serbia
[47] Department of Health and Physical Education, Thaksin University, Songkhla, Thailand
[48] Political Science, University of Nevada, Las Vegas, Las Vegas, NV, USA
[49] Department of Psychology, University of Georgia, Tbilisi, Georgia
[50] Department of Psychology, Sapienza University of Rome, Rome, Italy
[51] Department of Psychology, Izmir University of Economics, İzmir, Turkey
[52] Education Universidad Internacional de Valencia, Valencia, Spain
[53] Ciipme Conicet, Buenos Aires, Argentina
[54] School of Psychological Sciences, University of Melbourne, Melbourne, Australia
[55] Institute of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary
[56] Division of Psychology, School of Education and Social Sciences, University of the West of Scotland, Paisley, Scotland, UK
[57] Departament of Psychology, University of Porto, Porto, Portugal
[58] CLLE, Université de Toulouse, Toulouse, France
[59] Department of Administration, Getúlio Vargas Foundation, Rio de Janeiro, Brazil
[60] Department of Psychology, Universidad del Norte, Puerto Colombia, Colombia
[61] Department of Psychology, Saint Petersburg State University, Saint Petersburg, Russian Federation
[62] Department of Primary Education, National and Kapodistrian University of Athens, Athens, Greece
[63] ELTE Eötvös Loránd University, Budapest, Hungary
[64] Institute of Sports Professions, Ibn Tofail University, Kenitra, Morocco
[65] Department of Psychology, Manisa Celal Bayar University, Manisa, Turkey
[66] Department of Pedagogy and Psychology, Kuban State University, Krasnodar, Russian Federation
[67] Escuela de Psicología, Universidad Católica del Norte, Antofagasta, Chile
[68] Mental Health, Gulu University, Gulu, Uganda
[69] Department of Psychology, Neapolis University Pafos, Paphos, Cyprus

[70] Department of Psychology, Pamukkale University, Denizli, Turkey
[71] Department of Psychology, Center For Research On Biological Basis of Social Behavior, SWPS University of Social Sciences and Humanities, Warsaw, Poland
[72] Department of Education, International University of Valencia, Valencia, Spain
[73] Institute of Pedagogy, University of Wrocław, Wrocław, Poland
[74] School of Psychological Sciences, National Autonomous University of Honduras, Tegucigalpa, Honduras
[75] Escuela de Psicología, Pontificia Universidad Católica del Ecuador-Ambato, Ambato, Ecuador
[76] Department of Psychology, University of Santo Tomas, Manila, Philippines
[77] Faculty of Psychology, Universidad Cooperativa de Colombia, Medellín, Colombia
[78] Department of Theoretical and Practical Psychology, Kazakh National Women's Pedagogical University, Almaty, Kazakhstan
[79] Department of Psychological Counseling and Guidance, Mef University, Istanbul, Turkey
[80] Carrera de Psicología, Universidad Politécnica Salesiana, Quito, Ecuador
[81] Department of Psychosocial Science, University of Bergen, Bergen, Norway
[82] Cognitive and Behavioral Neuroscience Lab, University of Stavanger, Stavanger, Norway
[83] Faculty of Arts, Psychology and Theology, Åbo Akademi University, Turku, Finland
[84] ENES Bioacoustics Research Lab, CRNL, CNRS, Insern, University of Saint-Etienne, Saint-Etienne, France
[85] Department of Business Administration, University of Zurich, Zurich, Switzerland
[86] Department of Neurosciences and Developmental Biology, University of Vienna, Vienna, Austria
[87] Educational Psychology Program, University of Alabama, Tuscaloosa, AL, USA

Abstract

The current study investigates attitudes toward one form of sex for resources: the so-called sugar relationships, which often involve exchanges of resources for sex and/or companionship. The present study examined associations among attitudes toward sugar relationships and relevant variables (e.g., sex, sociosexuality, gender inequality, parasitic exposure) in 69,924 participants across 87 countries. Two self-report measures of Acceptance of Sugar Relationships (ASR) developed for younger companion providers (ASR-YWMS) and older resource providers (ASR-OMWS) were translated into 37 languages. We tested cross-sex and cross-linguistic construct equivalence, cross-cultural invariance in sex differences, and the importance of the hypothetical predictors of ASR. Both measures showed adequate psychometric properties in all languages (except the Persian version of ASR-YWMS). Results partially supported our hypotheses and were consistent with previous theoretical considerations and empirical evidence on human mating. For example, at the individual level, sociosexual orientation, traditional gender roles, and pathogen prevalence were significant predictors of both ASR-YWMS and ASR-OMWS. At the country level, gender inequality and parasite stress positively predicted the ASR-YWMS. However, being a woman negatively predicted the ASR-OMWS, but positively predicted the ASR-YWMS. At country-level, ingroup favoritism and parasite stress positively predicted the ASR-OMWS. Furthermore, significant cross-subregional differences were found in the openness to sugar relationships (both ASR-YWMS and ASR-OMWS scores) across subregions. Finally, significant differences were found between ASR-YWMS and ASR-OMWS when compared in each subregion. The ASR-YWMS was significantly higher than the ASR-OMWS in all subregions, except for Northern Africa and Western Asia.

Keywords: resources for sex, sugar relationships, cross-cultural comparison, human mating.

Introduction

Sex for resources has been common for centuries (e.g., concubine, mistress, paramour; Murdock, 1952; Nelson, 1993; Ringdal, 2007; Sanger, 1858; Scott, 2014). Sugar relationships are one modern version of transactional relationships that include sexual activity and/or companionship. In a sugar relationship, a man with resources (*sugar daddy*) or, less frequently, a woman with resources (*sugar mama*) provides material compensation (money or other assets) for the sexual companionship offered by a partner who is typically younger in age (*sugar baby* or, less frequently, *sugar boy*; Nayar, 2017).

In recent years, the nature of sugar relationships has been addressed in several different disciplinary approaches (Meskó et al., 2021). Sagar et al. (2016) adopt a sociological perspective on university students' motives for working in the sex industry. Mixon (2019) proposes an economic approach to sugar relationships, in which the concept of human capital investment explains the relatively high proportion of young female university students enrolled in expensive programs among the users of specialized dating sites. From a feminist perspective, Cordero (2015) points out the importance of negotiating power and agency by prospective partners in a sugar relationship. Other authors focus on the legal and ethical aspects of sugar relationships. Miller (2011), Motyl (2012), and Motz (2014) question whether sugar relationships should be legally defined as a form of sex work, considering that in countries where sex work (and active support for sex work) is banned, no comparable legal provision restricts the access to web services designed for managing sugar relationships. Ernst et al. (2021) focus on the prejudice, stigmatization, and social exclusion targeted at university students involved in the sex industry, which hinders these students in seeking and receiving emotional support from their social environment.

Wade (2009), the founder and CEO of *Seeking Arrangement* (the US sugar babies dating site), defines sugar relationships as an arrangement where one person provides intimacy, companionship, or other forms of attention in return for personal gain such as financial support or professional advancement. Scull (2020) states that this definition is more inclusive and representative of the diverse range of sugar relationships that exist as it encompasses those that do not involve sex or age disparities. This definition is preferable to academic ones as it is more inclusive and represents the wide range of sugar relationships that exist.

Exchanging sex for resources between young attractive partners and older partners with resources occurs in many present-day societies. The term transactional sex is mostly used by academics in reference to relationships in African countries to describe trades of sexual

accessibility for resources (e.g., Choudhry et al., 2014; Masvawure, 2010; Stoebenau et al., 2016; Wamoyi et al., 2010). The term *compensated date* (Chu, 2018) is typically used in Asia and Eastern Europe, including Hong Kong (Lee & Shek, 2013), Japan (McLellan, 2013), Moscow, Kyiv, and Minsk (Swader & Vorobeva, 2015). Finally, the term *sugar relationship* is most common in North America and Europe (e.g., Birkás et al., 2020; Ipolyi et al., 2021; Láng et al., 2021; Scull, 2022; Upadhyay, 2021). In this research, we will examine sugar relationships as a specific manifestation of the broader phenomenon of "sex for resources" transactions, alongside other known variations of this phenomenon.

Although little is known about the inner nature of sugar relationships, age difference is one of the fundamental and immanent components of this type of transactional relationship. The available data suggest that sugar relationships, unlike prostitution, cannot be seen as a "purely" business transaction by the participants. In sugar relationships, the older party often shares resources related to social capital in addition to material resources (skills, network, know-how, etc.; Ojebode et al., 2010) with the younger party. This age gap is an evolutionarily well-understood part of the human mating strategy (Conroy-Beam & Buss, 2019). Therefore, we considered it important to emphasize the importance of age in the present study.

In a qualitative study of Swedish sugar daddies, men often emphasized the desire for the presence of some degree of emotional intimacy and mutual enjoyment of the relationship and sexual interactions, in addition to the economic transaction. The interactions may include initial dates to facilitate these feelings. Furthermore, to create this atmosphere, the financial transaction is often framed as a "gift" rather than as a "payment for services" (Gunnarsson & Strid, 2022, 2023). This framing is captured well by one participant who described his experience of these relationships: "The women involved in [sugar dating] are more for real, you get to take part of their… real thoughts and real life, compared to being with a prostitute that you get to be with for 30 min or an hour. In some ways, it becomes more for real" (Gunnarson & Strid, 2022, p. 316).

In a sugar relationship, the partners engage in a direct sexual transaction lacking commitment and shared reproductive goals, which is possibly part of a short-term mating strategy (Anderson & Klofstad, 2012; Burtăverde & Ene, 2021; Whyte et al., 2019). In one interview study of 48 women from the United States, several common themes emerged for why they engaged in sugar relationships. The most commonly cited motivations were money (83%), followed by material items, services, activities, and other expenses (58%), followed by sexual interactions (27%) and the companionship (25%) or hope of finding love (13%), and finally mentorship and access to social networks (8%) and curiosity, boredom, or fun (8%) (Scull, 2022). A qualitative

Danish study of sugar babies aged 18–30 showed that the economic motive is dominant when engaging in sugar dating, but this is rarely the only motive (Groes et al., 2021). Additional motives were need for excitement, a wish to explore own sexual boundaries, or a need for appreciation/confirmation.

To measure psychological aspects of mating and their relation to sugar relationships in a standardized way, Birkás et al. (2020) developed an attitudinal measure of young people's openness to engage in sex for material compensation encounters (Acceptance of Sugar Relationships in Young Women and Men Scale; ASR-YWMS). Láng et al. (2021) published a complementary measure assessing older people's openness to provide compensation for sex with young partners (Acceptance of Sugar Relationship in Older Men and Women Scale, ASR-OMWS). Birkás et al. (2020) found that young (18–28 years) participants' positive attitude toward sugar relationships (ASR-YWMS) were positively associated with a manipulative, game playing love style (*Ludus*), self-centered sexual motivation, unrestricted sociosexual orientation, and socially aversive personality traits such as Machiavellianism or subclinical psychopathy (two components of the Dark Triad), as well as borderline personality organization. Láng et al. (2021) replicated these psychological correlates in a sample of older people (40–71 years), using the ASR-OMWS. These results were consistent with the idea that openness to sugar relationships is part of a short-term mating strategy aimed at gaining personal benefits rapidly. Birkás and Csathó (2015) found a positive correlation between the Dark Triad traits and present-oriented time perspectives, indicating that individuals with these socially aversive traits tend to prioritize short-term benefits and focus on situations that offer immediate rewards.

The present study examined several factors expected to have universal associations with attitudes toward sex-for-resources encounters. Considered here are potentially important correlates that have not been extensively explored in past research. To this end, a large multinational sample was surveyed for reliable cross-cultural differences in ASR (and, more generally, in openness to sex for resources) and for the universal predictors of these differences, taking into account possible moderators. Given the absence of directly related previous findings, the tested predictors were adopted from studies of related outcome variables such as preferred interpersonal distance (Sorokowska et al., 2017), affective interpersonal touch in close relationships (Sorokowska et al., 2021), and love experiences (Sorokowski et al., 2023). These included (1) individual-level predictors such as sex, age, sociosexual orientation, and parasite history; and (2) culture-level predictors such as collectivism, gender equality, and social welfare as measured by the Human Development Index (HDI). The sections below summarize the reasons for the focus on these individual and cultural level predictors.

In research, the distinction between individual and cultural context of predictor variables can be unclear (Leung, 1989). Individual-level predictors are directly related to the individual, which can explain differences between individuals. Cultural-level predictors are those variables that can explain why individuals belonging to a certain culture are similar to each other (e.g., have similar preferences, habits, values) and why they are different from individuals belonging to other cultural units. However, these two levels of predictors are not always sharply separated. For example, resistance to pathogens has both an individual dimension (immune system, health behavior, etc.) and a cultural dimension (prevalence of climate-specific parasites, level of health care, etc.). Thus, depending on whether we use a self-report questionnaire (individual aspect) or analyze a public database (cultural aspect), we can methodologically utilize both individual and cultural type data on the same individual (or cultural) level predictor.

Individual-Level Predictors

Sex

Previous studies consistently found that men scored higher on openness toward sugar relationships than women did (e.g., Birkás et al., 2020; Ipolyi et al., 2021; Láng et al., 2021; Scull, 2022; Upadhyay, 2021). These findings are in line with the proposed sex difference in prioritization of sexual variety and access among men, who have higher reproductive potential and lower minimum obligatory biological costs of mating, versus women, who have higher obligatory biological costs and might require long-term investment from a mate more consistently than men do (e.g., Buss, 1989; Walter et al., 2020).

Age

Past research has found no significant associations of age with acceptance of sugar relationships among men or women (Birkás et al., 2020; Ipolyi et al., 2021; Láng et al., 2021). Older people completed the ASR-OMWS, while younger people completed the ASR-YWMS, which had partially different items. Thus, attitudes toward openness to participating in sugar relationships were not directly comparable between the two age groups using this method. To shed more light on this matter, participants in this study completed both versions.

Sociosexual Orientation

Simpson and Gangestad (1991) use the term sociosexuality to describe one's willingness to engage in casual sex, particularly without emotional connection or commitment. Individuals with an unrestricted sociosexual orientation show a higher openness to casual sexual encounters (i.e., a short-term mating strategy) than those with a restricted sociosexual orientation, who are less willing to engage in uncommitted and emotionally detached sex (i.e., they pursue a long-term mating strategy; Penke & Asendorpf, 2008; Simpson & Gangestad, 1991, 1992). Schmitt

(2005) conducted a 48-nation study of sociosexuality, which examines the relationship between culture and human mating strategies. He found that sociosexuality, or the willingness to engage in sexual behavior outside of a committed relationship, varied widely across cultures. This is an important finding as it suggests that cultural factors might play a significant role in shaping human mating strategies. Birkás et al. (2020) found that the higher young participants scored on the ASR-YWMS, the more unrestricted sociosexual orientation they reported ($r = .52$), while Láng et al. (2021) observed a comparable positive association between scores on the ASR-OMWS and unrestricted sociosexuality reported by older participants ($r = .55$).

Parasite History

The external signs of pathogens carried by individuals have been an important source of information to observers since early stages of human evolution (Ewald, 1994). The ability to detect the relevant cues of an infection, combined with motivational systems such as disgust or fear when exposed to these cues provided an adaptive response to avoid close contact with the contagious person, would have likely enhanced survival and reproductive success (Anderson & May, 1991). The highest risk for a human group is posed by highly virulent non-endemic (i.e., previously not common) pathogens (Thornhill & Fincher, 2014, 2015). In addition to the pathogens transmitted in a wide variety of social situations, sexually transmitted infection (STIs) may have exerted further selection pressure on the human mating psychology (Mackey & Immerman, 2000). The feelings of disgust and fear of infection are adaptive emotional responses potentially reducing the risk of contracting an STI (Nesse & Ellsworth, 2009; Rozin et al., 2008). Hlay et al. (2022) found that the intensity of sexual disgust and pathogen disgust were positively associated with a more restricted sociosexual orientation.

Culture-Level Predictors

Individualism–Collectivism

Hofstede (1980, 1981) defines culture as the collective programming of the mind distinguishing the members of one group or category of people from others. One fundamental dimension on which cultures differ from each other is individualism–collectivism (IND–COL; Hofstede, 1980, 1981). In societies with high collectivism, people largely depend on close intragroup ties, while those living in societies with high individualism show a high preference for independence and maintain a strong sense of autonomy (Hofstede, 2001). As Nayar (2017) notes, the emergence of modern individualism (accompanied by a decline in collectivist values) shifted courtship and intimacy from the private sphere to the public sphere of recreation and consumerism. Mulvihill and Large (2019) go as far as suggesting that practices of "transactional intimacy" are replacing traditional interpersonal intimacy in individualistic societies. Based on

a cross-cultural study, Schmitt (2005) suggests that cultures that value individualism and self-expression tend to have higher levels of sociosexuality. In this perspective, young people engaging in sugar relationships (sugar babies/boys) choose to pursue a financial strategy to cope with their economic and social conditions when offering their older and wealthier prospective partners (sugar daddies/mommies) companionship in return for material compensation (Nayar, 2017). Minkov et al. (2013) found that so-called personal-sexual norms (e.g., participation to sex for resources) strongly correlated with national wealth and individualistic values. The wealthy and individualistic countries scored higher on the justifiability of these behavior, suggesting that individualism is associated with freedom of personal choice in crucially important matters, such as sexual behavior.

Gender Equality

According to the biosocial role theory (previously known as social role theory), sex differences in human behavior primarily originate in men's and women's different positions in social structures rather than in evolutionary processes resulting in dispositional differences (Eagly & Wood, 1999, 2016; Wood & Eagly, 2012). This perspective assigns primary importance to gender equality, which it considers to depend on whether women can release themselves from men's oppressive power (e.g., Coy, 2012). Consequently, gender equality is not possible as long as women submit themselves to men sexually (and otherwise). Sex for resources (e.g., sugar relationships, prostitution) is the most extreme case of sex-based oppression, since sexuality in this case is not an interaction that takes place between equal partners but a business transaction in which a man offers money to a woman in return for using her body as a means of sexual satisfaction. In an equality-oriented perspective, sex for resources results from a sexually oppressive patriarchal social order (Miller &

Schwartz, 1995; Upadhyay, 2021), which assigns particular importance to differentiated sex roles. The more differentiated sex roles (i.e., common gender-related behavioral norms and beliefs) are in a society, the more intense the pressure for conforming to role expectations (Wood & Eagly, 2012). Since sex for resources is a result of sex-based oppression, it is more frequent in societies where gender inequality is more pronounced (Benoit et al., 2019). According to research by Lippa (2009), there is a positive correlation between the degree of gender equality in a country and the magnitude of gender differences in sexual desire and sociosexuality, indicating that the level of gender equality may influence the size of gender disparities in sexual behavior and human mating strategies. Additionally, Schmitt (2005) found that cultures with greater gender equality tend to have higher levels of sociosexuality, while cultures with greater gender inequality tend to have lower levels of sociosexuality.

Human Development Index

The HDI is a composite measure including life expectancy (closely related to access to health care and nutrition), education (mean years of schooling completed and expected years of schooling upon entering the education system), and income per capita (Stanton, 2007). Cross-national differences in HDI have been associated with a number of individual-level variables, such as social trust (Özcan & Bjørnskov, 2011; Sorokowski et al., 2023). The relative development of a society presumably impacts the motives for sexual contact between men and women (e.g., Lippa, 2009; Schmitt, 2005). Even though both women and men are receptive to many of the qualities of a potential partner (e.g., place more importance on similarity and on socially appealing personality characteristics such as intelligence, honesty, warmth; Regan et al., 2000), several empirical findings show that there are potential sex differences in sexual preferences. Men generally prefer potential opposite-sex partners who are younger than themselves and physically attractive, while women prefer partners who are older and wealthier than themselves (Buss, 1989; Conroy-Beam et al., 2015; Walter et al., 2021; Zhang et al., 2019). Although no previous studies explored the relationship between openness to sex for resources and HDI, indirect empirical evidence suggests that they should be negatively associated. Specifically, young people living in developing countries are more exposed to sexual exploitation than those living in countries at a higher level of development (e.g., Averdijk et al., 2020; Krisch et al., 2019; LoPiccalo et al., 2016).

Research Aims and Hypotheses

The study design was informed by the basic methodological principles of cross-cultural research in psychology (see, e.g., Poortinga & Fontaine, 2022), and was part of a larger cross-cultural project (see Kowal et al., 2022, 2023). The aim of the present work was twofold. First (H1), the psychometric properties of the ASR-YWMS (Birkás et al., 2020) and the ASR-OMWS (Láng et al., 2021) were assessed with a large multinational sample. Furthermore, we tested the sex differences obtained in previous studies in both ASR scales (H2) and finally intra- and cross-subregional differences and similarities in both ASR scales (H3). According to our second aim, we (H4) explored the associations of ASR with the predictor variables.

Hypothesis 1

The first set of hypotheses centered around establishing the validity of the measures across cultures. When we tried to define the geographical unit of analysis, we found that the analysis by country was too fine-grained, while the analysis by 7 world regions seemed too oversimplified. Both would have made interpretation difficult. We therefore chose an

intermediate path and proceeded with the analysis by subregions. The sampled regions and subregions were coded in accordance with the standard country or area codes for statistical use published by the Statistics Division of the United Nations Secretariat (1999). Subregional analysis is a common and widespread method for understanding certain socio-economic and health processes (e.g., Nishimura et al., 2022; OECD, 2015; UNICEF & WHO, 2019).

Hypothesis 1.1 Cross-linguistic measurement invariance

It was expected that for each of the individual-level measures we used (ASR-YWMS; the ASR-OMWS; the Three-Item Sociosexual Orientation Inventory, SOI-3; the Gender-Equitable Men Scale, GEMS; and the Individualism–Collectivism scale), measurement invariance would be supported so that the data obtained from these measures would be suitable for further analysis.

Hypothesis 1.2 Cross-sexual measurement invariance

It was expected that our research scales, the ASR-YWMS and ASR-OMWS, would measure constructs of interest in a consistent way across men and women. That is, we hypothesized sexual invariance in both measures.

Hypothesis 2 Cross-sexual differences of the acceptance of sugar relationships

Based on sex differences obtained in previous analyses on Hungarian samples (men scored higher on both ASR measures; Birkás et al., 2020; Láng et al., 2021), we expected to obtain similar sex differences in the present multicultural analysis, with men scoring higher on both scales (i.e., ASR-YWMS and ASR-OMWS).

Hypothesis 3 Intra- and cross-subregional differences and similarities

We hypothesized that openness to sugar relationships measured by ASR-YWMS and ASR-OMWS would be articulated differently in different subregions and that this difference is not due to the cultural variation of the instruments.

Hypothesis 3.1 Cross-subregional measurement invariance

It was expected that the ASR-YWMS and ASR-OMWS are suitable for comparative analysis of subregions because the scales consistently measure constructs of interest across subregions, and thus are invariant across subregions.

Hypothesis 3.2 Cross-subregional differences of the acceptance of sugar relationships

It was expected that there are differences in ASR-YWMS and ASR-OMWS scores across subregions. That is, people living in different subregions have different attitudes toward openness to sugar relationships compared to each other.

Hypothesis 3.3 Intra-subregional differences between the ASR-YWMS and ASR-OMWS

It was expected that there are differences between ASR-YWMS and ASR-OMWS scores within cultures. It was also expected that the difference between ASR-YWMS and ASR-OMWS would differ between cultures.

Hypothesis 4 Associations between individual- and country-level predictors of the acceptance of sugar relationships

Openness to sugar relationships was expected to be associated with the different individual and country-level predictor variables based on the theoretical introduction.

Hypothesis 4.1 Individual-level predictors of ASR-YWMS

At the individual level, ASR-YWMS was expected to be associated positively with being a man, age, unrestricted sociosexual orientation (measured by the SOI-3), traditional gender roles (measured by the GEMS), individualistic values (measured by Collectivism Scale) and pathogen prevalence (measured by the nine-item Pathogen Prevalence Index).

Hypothesis 4.2 Country-level predictors of ASR-YWMS

At the country level, ASR-YWMS was expected to be associated positively with gender inequality (measured by the Gender Inequality Index), and parasite stress (measured by the Country-specific zoonotic and non-zoonotic parasite stress). Furthermore, ASR-YWMS was expected to be associated negatively with HDI and collectivism (measured by the 178-nation index of Ingroup Favoritism).

Hypothesis 4.3 Individual-level predictors of ASR-OMWS

At the individual level, ASR-OMWS was expected to be associated positively with being a man, age, unrestricted sociosexual orientation (measured by the SOI-3), traditional gender roles (measured by the GEMS), individualistic values (measured by Collectivism Scale), and pathogen prevalence (measured by the nine-item Pathogen Prevalence Index).

Hypothesis 4.4 Country-level predictors of ASR-OMWS

At the country level, ASR-OMWS was expected to be associated positively with gender inequality (measured by the Gender Inequality Index), and parasite stress (measured by the Country-specific zoonotic and non-zoonotic parasite stress). Furthermore, ASR-OMWS was expected to be associated negatively with HDI and collectivism (measured by the 178-nation index of Ingroup Favoritism).

Method

Participants and Procedure

A total of 118,324 participants from 176 countries completed the survey. After excluding those participants who did not meet the inclusion criteria (passing the attention check) and those

linguistic subsamples that did not reach the size of at least 100 participants, the final sample consisted of 69,924 individuals from 87 countries, who completed the survey in one of 37 languages (see details in Supplementary Materials).

The final sample included 45,509 (65.12%) women, 23,449 (33.55%) men, 665 (.91%) non-binary individuals, 264 (.38%) chose "prefer not to say," and 37 participants who provided no data regarding their gender. Regarding sex at birth 45,745 (66.03%) were female, 23,434 (33.83%) participants' sex were male, 96 (.14%) were intersex, and 649 did not respond. The participants were aged 18 to 90 years ($M = 29.68$, SD = 11.99, $Mdn = 25$). Regarding intimate partner relationship, 17,685 (25.32%) participants were dating someone, 9,050 (12.96%) were in a committed relationship, 14,494 (20.75%) were married, 28,626 (40.98%) single, and 2069 did not respond. Regarding employment, 18,966 (32.86%) participants were students, 3,720 (6.44%) were in full time employment, 4,522 (7.83%) were in part time employment, 4,302 (7.45%) were self-employed, 24,560 (42.55%) were unemployed, 1,652 (2.86%) were retired, and 12,202 did not respond. (See Table S1.A and Table S1.B in Supplementary Materials for demographic data by country.)

The original Hungarian survey was translated into 37 languages, and all translated versions were checked for consistency with the back-translation method (Brislin, 1970, 1983; Hambleton & De Jong, 2003; Muñiz et al., 2013; see Supplementary Materials for the detailed instructions provided for all translation teams). Data were collected online between April and August 2021. Online data collection was conducted via Qualtrics in all but four countries. Due to technical reasons, one Russian collaborator collected data using the Toloka website (a crowdsourcing platform popular in Russia), the Algerian and Moroccan participants provided data in a paper-and-pencil format, and the Iranian participants completed a Google form. The collaborators ensured that all national subsamples were heterogeneous in terms of sex, age, residence (urban vs. rural), and education. The participants were invited to share the link to the survey to their own networks on social media platforms. Approximately 6% of the obtained data were collected with the help of outsourcing companies. The brief descriptive statistics regarding the sample size, sex, and age in each language group is presented in Table S2 in Supplementary Materials for additional information.

Transparency and Openness

We report how we determined our sample size, all data exclusions, all manipulations, and all measures in the study, and we follow Journal Article Reporting Standards (JARS; Kazak, 2018). All data, analysis code, and research materials are available at https://osf.io/prdj2/?view_only=48e348faeac344a59554ad44c7e89482. Data were analyzed

using R, version 4.0.0 (R Core Team, 2020). See the section Analytic Plan for the detailed analytic methodology. This study's design and its analysis were not pre-registered.

Individual-Level Measures

Acceptance of Sugar Relationships in Young Women and Men Scale

The ASR-YWMS (Birkás et al., 2020) is a five-item scale assessing one's willingness to engage in a sugar relationship as the younger partner (sugar baby/boy), who provides sexual companionship for the older partner in return for material compensation (gifts and/or money). Examples of items include: If it would benefit my career, I would think about engaging in a sugar relationship; I would seriously consider engaging in a sugar relationship if I thought it would help me have a better financial situation. The participants rated each item on a seven-point scale ranging from Absolutely disagree (1) to Absolutely agree (7). (See the 37-language version of the ASR-YWMS and details of internal consistency in Table S3 in Supplementary Materials.)

Acceptance of Sugar Relationships in Older Men and Women Scale

The ASR-OMWS (Láng et al., 2021) is a five-item scale assessing one's willingness to engage in a sugar relationship as the older partner (sugar daddy/mommy), who provides material compensation (gifts and/or money) for the younger partner in return for sexual companionship. Examples of items include: "If it would be beneficial for my sex life or for others' judgment of me, I would consider engaging in a sugar relationship"; "I would seriously consider engaging in a sugar relationship if that was the way to find a partner who would meet all my needs." The participants rated each item on a five-point scale ranging from Absolutely disagree (1) to Absolutely agree (7). (See the 37-language version of the ASR-OMWS and details of internal consistency in Table S3 in Supplementary Materials.)

Three-Item Sociosexual Orientation Inventory (SOI-3)

The Revised Sociosexual Orientation Inventory (SOI-R; Penke & Asendorpf, 2008) is a nine-item scale assessing one's sociosexual behavior, attitude, and desire with three items each. Since the present study only focused on the participants' overall sociosexual orientation and due to space constraints, we only used one item of each component: Sociosexual behavior (With how many different partners have you had sexual intercourse without having an interest in a long-term committed relationship with this person?); Sociosexual attitude (I can imagine myself being comfortable and enjoying "casual" sex with different partners); and Sociosexual desire (In everyday life, how often do you have spontaneous fantasies about having sex with someone you have just met?). The participants rated each item on a nine-point scale and ranging from "1 = 0 to 9 = 20 or more" for Sociosexual behavior; ranging from "1 = Strongly disagree" to

"9 = Strongly agree" for Sociosexual attitude, and "1 = Never" to "9 = At least once a day" for Sociosexual desire. Higher overall scores indicated a more unrestricted sociosexual orientation. (See details of internal consistency in Table S3 in Supplementary Materials.)

Gender-Equitable Men Scale

The original GEMS (Pulerwitz & Barker, 2008) is a 24-item scale assessing young men's attitudes toward various sex-related norms. A more recently developed version (Levtov et al., 2014) comprises five subscales (Gender, Violence, Masculinity, Sexuality, and Reproductive Health), of which the Gender subscale was used in the present study to assess the male participants' adherence to traditional gender roles. The subscale comprises three reverse-scored items: A woman's most important role is to take care of her home and cook; Changing diapers, giving kids a bath, and feeding kids are the mother's responsibility; A man should have the final word about decisions in his home. Each was rated on a seven-point scale ranging from Absolutely agree (1) to Absolutely disagree (7). (See details of internal consistency in Table S3 in Supplementary Materials.)

Personal Individualism Measured Using the Collectivism Scale

The items were consistent with the collectivism-to-individualism continuum proposed by Hofstede (1981, 2001). The scale comprises four reverse-scored items as follows: Group welfare is more important than individual rewards; Group success is more important than individual success; Being accepted by the members of the workgroup is very important; and Employees should pursue their goals only after considering the welfare of the group. After analyzing the Collectivism Scale (Wu, 2006), it became evident that the third item may not reliably represent general attitudes toward individualism because it focused specifically on a workplace context where different norms might operate. We performed an exploratory factor analysis and this item loaded onto the individualism attitudes less than did the other items (.37 as compared to .83, .87, and .50), and fell below the usually recommended criterion (i.e., below .40; Costello & Osborne, 2005). We therefore removed that item and used the remaining three items in all subsequent analyses. The participants rated each item on a seven-point scale ranging from Absolutely disagree (1) to Absolutely agree (7). Higher overall scores indicated higher individualism. (See details of internal consistency in Table S3 in Supplementary Materials.)

Parasite History

The 9-item Pathogen Prevalence Index (Murray & Schaller, 2010) was used to measure parasite history. The participants responded to the question, Have you ever contracted (been sick with) any of the following diseases? concerning each of nine infectious diseases, including leishmanias, schistosomes, trypanosomes, leprosy, malaria, typhus, filariae, dengue, and

tuberculosis, for which Murray and Schaller (2010) calculated the index at a regional level. The response alternatives were Never (0), Once (1), and More than once (2). Higher overall scores indicated more frequent past experiences with parasites. (See details of internal consistency in Table S3 in Supplementary Materials.)

Country-Level Measures

Gender Inequality Index and Human Development Index

Gender Inequality Index (GII) and the HDI of each sampled country (for data on the HDI—Human Development Report, 2021/2022; United Nations Development Programme, 2022) were used for analyses.

National Collectivism

The 178-nation index of Ingroup Favoritism from Van de Vliert (2011) was used as a proxy for the collectivism score for each country.

Parasite Load

Country-specific zoonotic and non-zoonotic parasite stress in a given region were analyzed using data reported by Fincher and Thornhill (2012).

Analysis Plans

Cross-Linguistic Measurement Invariance Test and Measurement Alignment

In the present study, participants were presented with different survey forms depending on their language. Because we intended to examine the relationship between variables with data collected across different languages, we needed to assure that the survey forms in different languages were measuring the constructs of interest in a consistent manner, particularly when the constructs were measured in terms of latent variables requiring validity checks (Fischer & Karl, 2019).

To be able to assure the requirement for cross-language data analysis, we conducted a measurement invariance test to assess whether the measurement model of each scale in the survey forms was consistently valid across different language versions (Putnick & Bornstein, 2016). The measurement invariance test was performed via multigroup confirmatory factor analysis (MG-CFA) in R package, using *lavaan*. Whether measurement invariance was supported for a scale was determined by the changes in the fit quality indicators, that is, root mean square error of approximation (RMSEA), standardized root mean squared residual (SRMR), and comparative fit index (CFI), across different levels of model constraints. The least restrictive level of model invariance is configural invariance, which only assumes an equal measurement model across different groups. Metric invariance assumes equal factor loadings in addition to configural invariance. Scalar invariance additionally requires equal intercepts. Finally, the

most restrictive form of invariance, residual invariance, additionally assumes equal residuals. In cross-group studies involving multiple-group comparisons of latent variables, at least scalar invariance should be supported. If scalar invariance was supported, we assumed that composite scores were possible to use for further analyses.

Whether a specific level of invariance is supported by evidence was determined by examining to what extent RMSEA, SRMR, and CFI change when an additional assumption is added while performing MG-CFA (Putnick & Bornstein, 2016). First, the first level of invariance, configural invariance, is tested by examining the fit indicators when MG-CFA is conducted. We planned to utilize the widely used criteria for this purpose, that is, RMSEA and SRMR $< .08$, and CFI $\geq .90$ (Hu & Bentler, 1999). For metric invariance, we tested ΔRMSEA and ΔSRMR $< +.30$, and ΔCFI $\geq -.01$, and for scalar and residual invariance, ΔRMSEA and ΔSRMR $< +.15$, and ΔCFI $\geq -.01$. In all cases, as the observed responses were anchored to ordinary scales, not continuous scales, we used the WLSMV estimator to minimize the potential bias (Li, 2016).

If scalar invariance was not supported by evidence, we conducted measurement alignment to address the non-invariance issue (Tam & Milfont, 2020). Measurement alignment is a psychometric method that adjusts factor loadings and intercepts to absorb the existing non-invariance and achieve scalar invariance for cross-group analysis (Asparouhov & Muthén, 2014). Measurement alignment was performed with an R package, *sirt* (Robitzsh, 2021). After performing measurement alignment, we examined whether R^2_{loadings} and $R^2_{\text{intercepts}}$, which indicate to what extent the non-invariance in factor loadings and intercepts were absorbed via alignment, respectively, were .75 or higher (Han, 2022b). When these values exceeded .75, we assumed that alignment successfully addressed the non-invariance issue.

Then, Monte Carlo simulations were performed to test whether alignment was able to absorb non-invariance in a consistent and valid manner. We generated simulation datasets with $N = 100$, 200, and 500 with the mean and variance of a scale score of interest in each group (Han et al., 2022). Then, we performed measurement alignment and then the resultant group latent means were significantly correlated with the group latent means estimated from ordinary MG-CFA. Following Han et al. (2022), we examined whether the correlation coefficient was .95 or higher (Muthén & Asparouhov, 2018). For additional information, we also examined the correlation of group variances, although it was not required to be .95 or higher. To speed up the repetitive simulation processes, we employed multiprocessing, which utilized multiple processes, as done in Han et al. (2022). Once measurement alignment was successfully completed,

we calculated latent factors scores of the tested scales with adjusted factor loadings and intercepts for further analyses.

Comparison of Measurement Invariance Between Men and Women

To be able to compare the ASR-YWMS and ASR-OMWS across two sexes, first, we performed additional data filtering. In this process, we only extracted responses collected from participants who identified their current gender as identical to their sex at birth, and who were not sexually non-binary. Then, we conducted the measurement invariance test by employing the same procedures and criteria that were used to examine cross-linguistic invariance. If scalar invariance was supported and measurement alignment was not required, then we compared the latent mean score between groups of men and women. If scalar invariance was not supported, we conducted measurement alignment and then calculated factor scores with adjusted factor loadings and intercepts. Then, we compared the latent mean score, which was calculated with the adjusted factor scores, between the two groups.

Comparison was performed by both frequentist and Bayesian *t*-tests. Bayesian *t*-test was performed to examine whether our alternative hypothesis, which was whether there was a significant nonzero difference in the variable of interest across two different groups, was supported by evidence directly, instead of testing whether our null hypothesis should be rejected (Wagenmakers et al., 2018a). Given *p*-values are only capable of testing the null hypothesis, not the alternative hypothesis that we were interested in, and likely to lead to inflated false positives, we decided to examine Bayes Factors (BF) additionally (Wagenmakers et al., 2018b).

BFs indicate to what extent an alternative hypothesis is more favored by evidence compared with a null hypothesis. For instance, if BF = 10, it means that evidence ten times more strongly supports an alternative hypothesis versus a null hypothesis. In general, when BF ≥ 3, it is possible to assume that there is significant positive evidence supporting an alternative hypothesis. In the same vein, BF ≥ 10 implies strong evidence while BF ≥ 100 implies very strong evidence (Han, 2022a; Raftery, 1995). In the present study, Bayesian *t*-test was performed with an R package, *BayesFactor* (Morey et al., 2018). Additionally, we also calculated an effect size indicator, Cohen's *d*.

Cross-Subregional Comparison of Measurement Invariance

While comparing the ASR-YWMS and ASR-OMWS across fourteen different geographical regions, we first started with the measurement invariance test and measurement alignment similar to the cross-sexual comparison. Once the measurement invariance test and measurement alignment were completed, we examined whether there was a significant difference in the ASR-YWMS and ASR-OMWS across the subregions via ANOVA. In addition to frequentist

ANOVA, we also conducted Bayesian ANOVA with *BayesFactor*. The same BF criteria were used to determine whether an alternative hypothesis was supported. After performing ANOVA, we performed the post hoc test via Tukey's honestly significant difference (HSD) test to examine which pairs of subregions demonstrated the significant difference while controlling for the family-wise error rate.

Intra-Subregional Comparison of Measurement Invariance

We also compared the ASR-YWMS with ASR-OMWS in each individual subregion. Because two different scales were compared, we employed a method for nonparametric comparison, the Wilcoxon test. When *p*-values were calculated, we performed the false discovery rate correction to prevent potential inflated false positives. In addition to the Wilcoxon test statistics, we also calculated Cohen's *d* to examine the effect sizes.

Bayesian Multilevel Modeling

To examine the association between individual- and country-level predictors and ASR variables, we conducted Bayesian multilevel modeling. Bayesian multilevel modeling allows to explore whether one model is better supported by evidence compared with another model in terms of a BF (Han, 2022a). For each dependent variable, we compared these four models:

- Model 0: DV ~ Intercept (null model)
- Model 1: DV ~ Predictors (fixed effect only model)
- Model 2: DV ~ Predictors + (1|Country) (random intercept model)
- Model 3: DV ~ Predictors + (1+Predictors|Country) (random slope model)

Each model was estimated with *brms* package (Bürkner, 2017). In this process, the default Cauchy prior distribution, Cauchy (0, 1), and the Gaussian family were employed. In addition, for better convergence and interpretation, all variables were standardized. To calculate model BFs, we compared Model 1 versus Model 0 (BF10), Model 2 versus Model 0 (BF20), Model 3 versus Model 0 (BF30). We deemed the model with the highest model BF value as the best model (Dawson et al., 2021).

Once the best model was identified, we examined whether each predictor was significant with the BF of each predictor. For instance, in the case of age, age was hypothesized to be positively associated with ASRs. Then, we assumed:

- H0 (null hypothesis): b(age) ≤ 0
- H1 (alternative hypothesis) b(age) > 0

and, calculated BF10 indicating extent to which H1 was more strongly supported by evidence compared with H0. Once BF10 ≥ 3, we deemed that the hypothesis, H1, was positively supported by evidence.

Results

Cross-Linguistic Measurement Invariance Test and Measurement Alignment (H1.1)

We examined whether measurement invariance was supported for each individual-level measure that we employed so that the data acquired with such measures are suitable for further analyses. We tested whether scalar invariance, which assumes equal factor loadings and intercepts across language groups, was supported. In this process, the ASR-YWMS, ASR-OMWS, SOI-3, GEMS, and Individualism–Collectivism Scale were tested. The nine-item Pathogen Prevalence Index was not tested for its measurement invariance because in some languages, all participants provided the same response to certain items (e.g., no Dengue infections for participants responding in languages spoken in European countries).

Table 1 demonstrates the results from the measurement invariance tests. In all cases, scalar invariance was not supported, so we performed measurement alignment to address the non-invariance in the measures. In addition, the Persian version of the ASR-YWMS and Individualism–Collectivism Scale were excluded from the tests due to a convergence issue. Table 2 reports the results from measurement alignment as well as Monte Carlo simulations to examine whether the results were reliable and valid. The measurement alignment procedures were able to address the non-invariance issue successfully given more than 75% of the non-invariance in factor loadings as well as intercepts were absorbed via alignment (see R^2_{loadings} and $R^2i_{\text{ntercepts}}$). Also, the results from Monte Carlo simulations support the point that the outcomes were well replicated, so measurement alignment was able to produce reliable and valid outcomes. Thus, for our main analysis, we employed factor scores calculated with the factor loadings and intercepts adjusted via measurement alignment.

Table 1 *Cross-lingual measurement invariance tests*

	RMSEA	SRMR	CFI	ΔRMSEA	ΔSRMR	ΔCFI
Acceptance of Sugar Relationships in Young Women and Men Scale (ASR-YWMS)						
Configural invariance	.052	.010	.994	-	-	-
Metric invariance	.073	.029	.977	.021	.018	-.016
Acceptance of Sugar Relationships in Older Men and Women Scale (ASR-OMWS)						
Configural invariance	.065	.014	.990	-	-	-
Metric invariance	.084	.033	.971	.018	.019	-.019
Three-Item Sociosexual Orientation Inventory (SOI-3)						
Configural invariance	.000	.000	1.000	-	-	-

Metric invariance	.066	.026	.976	.066	.026	-.024
Gender-Equitable Men Scale (GEMS)						
Configural invariance	.000	.000	1.000	-	-	-
Metric invariance	.069	.021	.977	.069	.021	-.023
The Individualism-collectivism Scale						
Configural invariance	.000	.000	1.000	-	-	-
Metric invariance	.059	.021	.987	.059	.021	-.013

Table 2 *Measurement alignment and Monte Carlo simulation results*

			Monte Carlo Simulation											
			N = 100				*N* = 200				*N* = 500			
			cor (mean)		*cor (var)*		*cor (mean)*		*cor (var)*		*cor (mean)*		*cor (var)*	
	R^2_{lodings}	$R^2_{\text{intercepts}}$	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
SOI-3	.96	.98	.97	.03	.51	.15	.97	.02	.49	.13	.98	.01	.46	.12
GEMS	.99	.95	.98	.01	.89	.19	.98	.01	.94	.07	.98	.01	.95	.02
IND-COL	1.00	1.00	.97	.01	.91	.05	.97	.01	.94	.04	.97	.01	.96	.01
ASR-YWMS (by language)	.99	.99	.95	.06	.95	.04	.96	.05	.94	.04	.97	.04	.94	.03
ASR-YWMS (by subregion)	.99	1.00	.99	.00	.98	.01	1.00	.00	.98	.01	1.00	.00	.98	.01
ASR-OMWS (by language)	.99	.99	.97	.02	.96	.01	.97	.01	.96	.01	.97	.01	.95	.01
ASR-OMWS (by sex)	1.00	1.00	1.00	.00	.97	.24	1.00	.00	.98	.18	1.00	.00	1.00	.00
ASR-OMWS (by subregion)	.99	1.00	.99	.01	.97	.02	.99	.01	.97	.02	1.00	.00	.96	.02

Additionally, both the ASR-YWMS and ASR-OMWS demonstrated good reliability in terms of McDonald's ω in all languages ($\omega \geq .80$). In the cases of the SOI-3 and collectivism scales, ω values were higher than .60 in all languages indicating at least acceptable reliability. The GEMS reported acceptable reliability ($\geq .60$) in all languages except Arabic. In general, languages reported acceptable to good reliability ($\geq .70$) in the case of the Pathogen Prevalence Index; however, Arabic, Spanish, and Portuguese were exceptions ($< .60$). See Table S3 in Supplementary Materials for full information.

Cross-Sexual Measurement Invariance Test of the Acceptance of Sugar Relationships Scales (H1.2)

Before conducting the cross-sexual comparison of the acceptance for sugar relationships between men and women, we tested whether our scales, the ASR-YWMS and ASR-OMWS, measured the constructs of interest across sexes in a consistent manner via the measurement invariance test. Table 3 reports the results from the measurement invariance test. The most restrictive invariance, residual invariance, which assumes the equal loadings, intercepts, and residuals, was supported in the case of the ASR-YWMS. However, scalar invariance was not supported in the ASR-OMWS, so we performed measurement alignment. As shown in Table 2, the non-invariance was successfully absorbed in a reliable and valid manner. The outcome suggests that both scales can be used for cross-language investigations after performing measurement alignment.

Table 3 *Cross-sexual measurement invariance tests*

	RMSEA	SRMR	CFI	ΔRMSEA	ΔSRMR	ΔCFI
Acceptance of Sugar Relationships in Young Women and Men Scale (ASR-YWMS)						
Configural invariance	.043	.008	.996	-	-	-
Metric invariance	.035	.011	.996	-.007	.004	.000
Scalar invariance	.046	.016	.991	.010	.005	-.005
Residual invariance	.051	.023	.987	.005	.006	-.004
Acceptance of Sugar Relationships in Older Men and Women Scale (ASR-OMWS)						
Configural invariance	.064	.013	.990	-	-	-
Metric invariance	.041	.014	.995	-.023	.001	.004
Scalar invariance	.057	.020	.986	.016	.007	-.008

Cross-Sexual Comparison of the Acceptance of Sugar Relationships (H2)

First, we utilized the multigroup CFA, which was already implemented while testing the measurement invariance, to compare the ASR-YWMS scores between men and women.

Because scalar invariance was supported in this case, measurement alignment was not required for the cross-group comparison. When the latent mean was compared between the two groups, men reported the significantly higher ASR-YWMS mean score compared with women, $t(45{,}106) = 33.06$, $p < .001$, Cohen's $d = .27$, 95% CI [.25, .29], log(BF) = 553.62.

Second, we compared the factor score of the ASR-OMWS, which was calculated with the factor loadings and intercepts adjusted via measurement alignment, because scalar invariance was not supported for this scale. The comparison result indicated that men demonstrated the significantly higher ASR-OMWS mean score compared with women, $t(43{,}445) = 46.50$, $p < .001$, Cohen's $d = .39$, 95% CI [.34, .45], log(BF) = 1118.45.

Cross-Subregional Measurement Invariance Test of the Acceptance of Sugar Relationships Scales (H3.1)

Footnote [1] As in the case of the cross-sexual comparison, we also conducted the measurement invariance test to assure that the scales measured the constructs of interest consistently across different subregions. Table 4 reports the results from the test of both scales. Scalar invariance was not supported for both the ASR-YWMS and ASR-OMWS. Hence, we performed measurement alignment to address the non-invariance issue. As shown in Table 2, the non-invariance was successfully absorbed in a consistent manner for both scales. For the planned cross-subregional comparison, we used the factor scores calculated with the factor loadings and intercepts adjusted via measurement alignment.

Table 4 *Cross-subregional measurement invariance tests*

	RMSEA	SRMR	CFI	ΔRMSEA	ΔSRMR	ΔCFI
Acceptance of Sugar Relationships in Young Women and Men Scale (ASR-YWMS)						
Configural invariance	.048	.010	.995	-	-	-
Metric invariance	.075	.025	.978	.027	.016	-.017
Acceptance of Sugar Relationships in Older Men and Women Scale (ASR-OMWS)						
Configural invariance	.068	.014	.990	-	-	-
Metric invariance	.082	.030	.974	.013	.017	-.016

Cross-Subregional Comparison of the Acceptance of Sugar Relationships (H3.2)

We visualized the mean score, which was calculated in terms of the latent mean score via measurement alignment, of the ASR-YWMS and ASR-OMWS in each subregion in Figs. 1 and 2, respectively.

Fig. 1 *Mean Acceptance of Sugar Relationships in Young Women and Men Scale by subregion. The darker shade indicates higher scores (white areas indicate a lack of data for a given region). Note: Colored figures available in electronic version only*

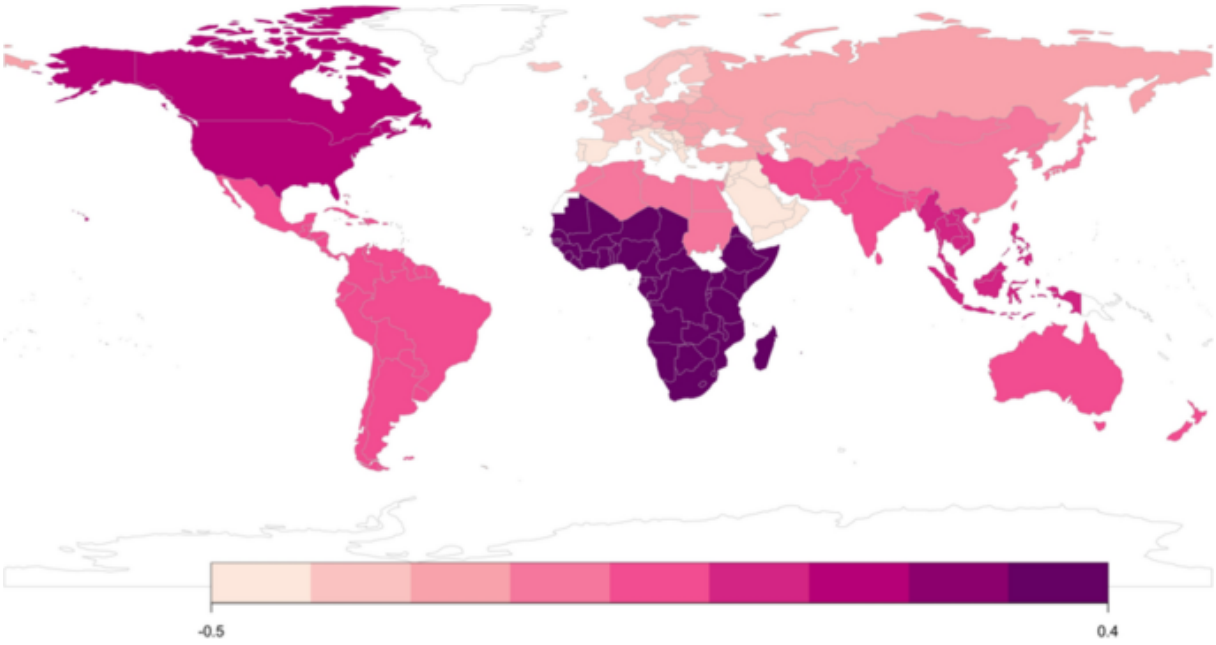
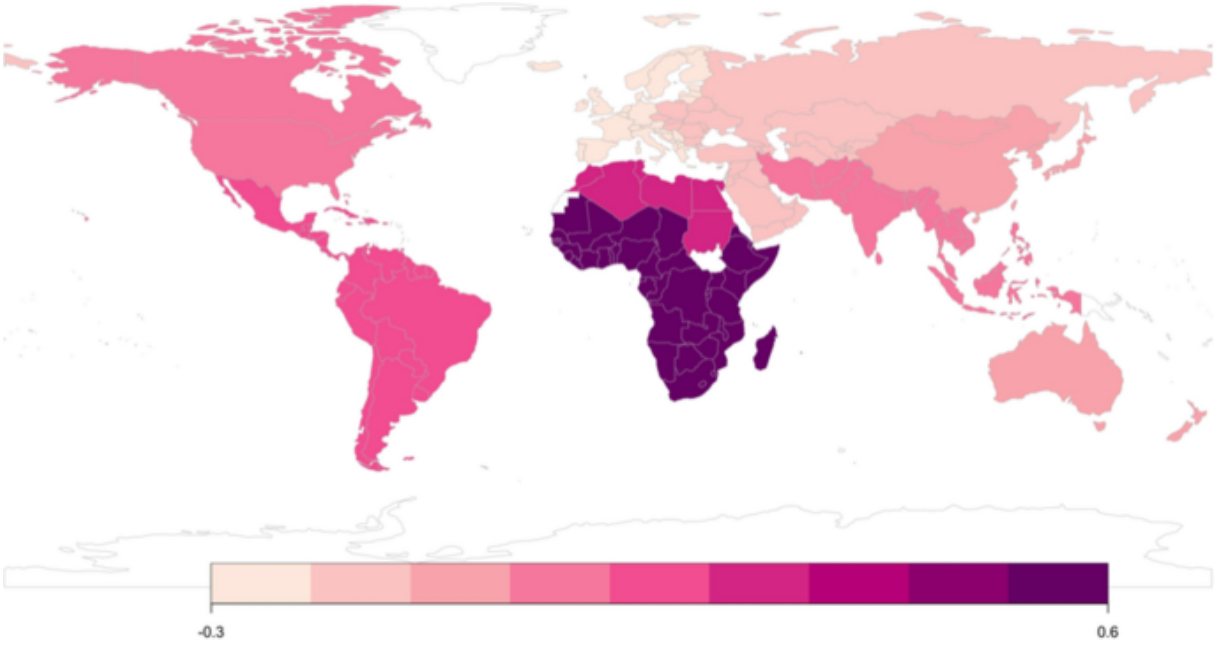
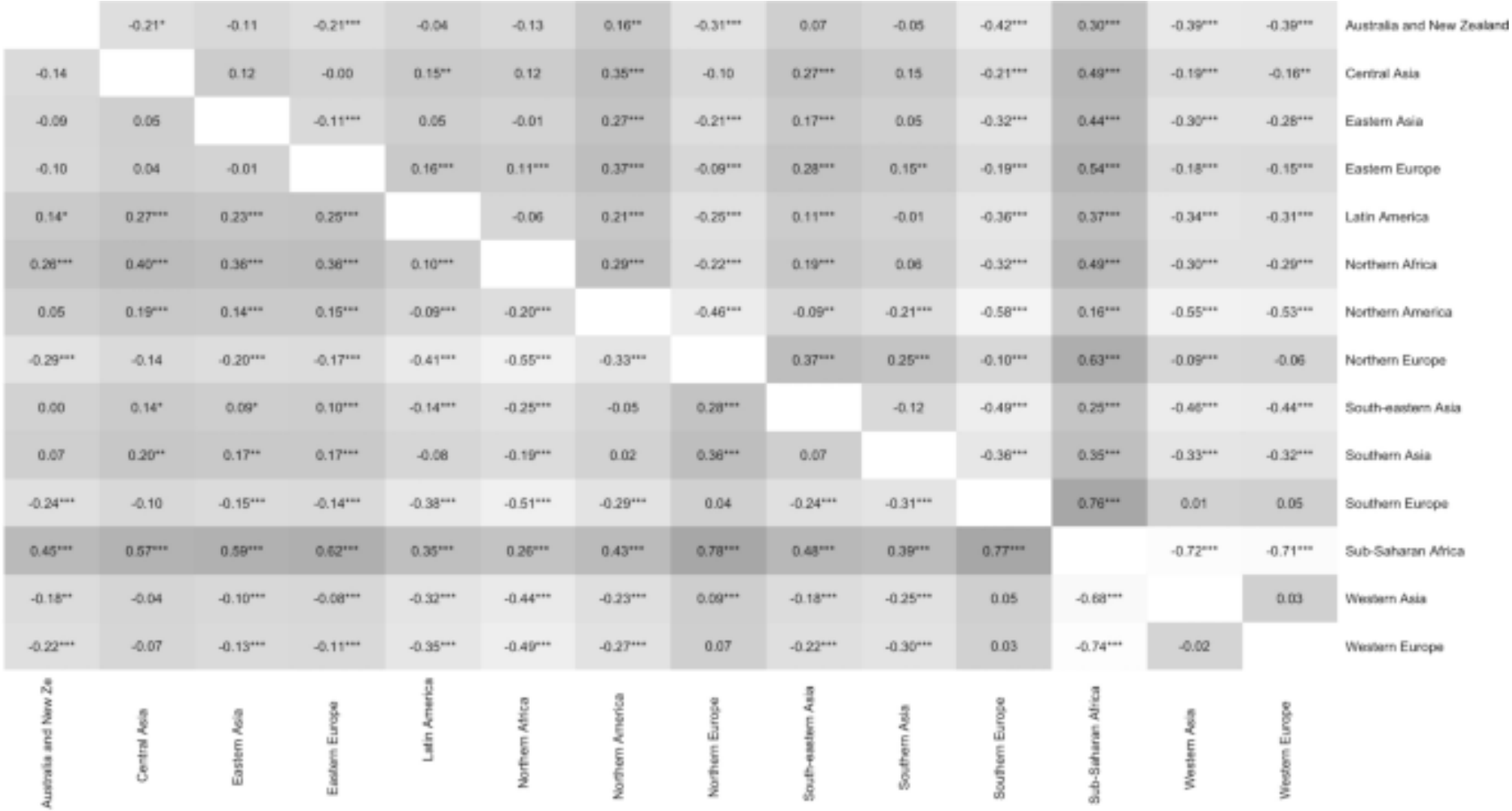


Fig. 2 *Mean Acceptance of Sugar Relationships in Older Women and Men Scale by subregion. The darker shade indicates higher scores (white areas indicate a lack of data for a given region). Note: Colored figures available in electronic version only*



ANOVA indicated that there were significant differences in the ASR-YWMS scores across different subregions, $F(13, 10{,}148) = 183.49$, $p < .001$, $\eta 2 = .19$, $\log(BF) = 1{,}251.88$. We also performed post hoc analysis via Tukey's honestly significant different (HSD) test to control for the family-wise error rate. The result of the post hoc analysis is reported in the upper diagonal of Fig. 3.

Fig. 3 *Cross-subregional differences between ASR-YWMS and ASR-OMWS. Note: Each cell demonstrates the Cohen's d value resulting from each pair of comparison. Upper diagonal: comparisons of the ASR-YWMS. Lower diagonal: comparisons of the ASR-OWMS*



A similar trend was found when the ASR-OMWS was examined. The result from ANOVA suggests that there were significant cross-subregional differences in the ASR-OMWS scores across subregions, $F(13, 10{,}126) = 160.04$, $p < .001$, $\eta 2 = .17$, $\log(BF) = 1090.74$. The result from the post hoc test is demonstrated in the lower diagonal of Fig. 3.

Intra-Subregional Comparison Between the Acceptance of Receiving versus Giving Sugar Relationships (H3.3)

We compared the ASR-YWMS and ASR-OMWS in each subregion. Table 5 summarizes the descriptive statistics of ASR-YWMS and ASR-OMWS, and the result of the comparison between them in each subregion. The comparison results are visualized in Fig. 4. After the false discovery rate correction, except for Northern Africa and Western Asia, the ASR-YWMS was significantly higher than the ASR-OMWS in all subregions. In Northern Africa, we found the opposite trend. There was no significant difference between the two scales in Western Asia.

Fig. 4 *Cohen's d of (ASR-YWMS—ASR-OMWS) within each subregion (white areas indicate a lack of data for a given region). Note: Colored figures available in electronic version only*

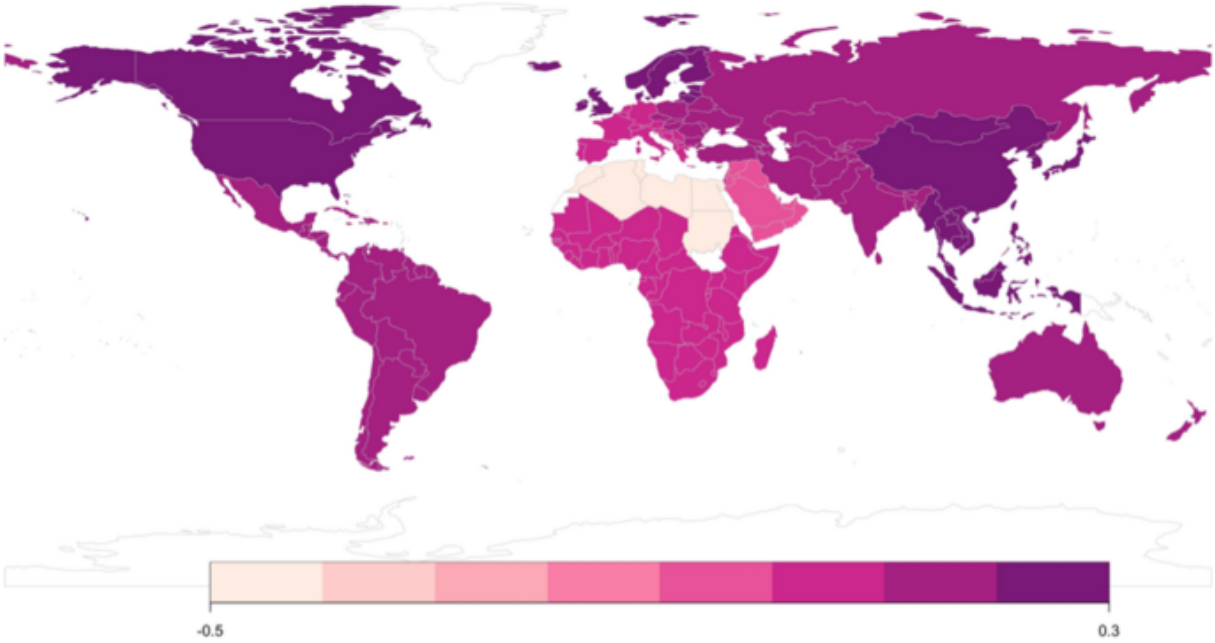


Table 5 *Results from intra-subregional comparisons of Acceptance of Sugar Relationships*

		ASR-YWMS			ASR-OMWS			Wilcoxon test		
Subregion	*N*	*M*	*SD*	Mdn	*M*	*SD*	Mdn	*z*	*p*-value (FDR)	Cohen's d
Australia and New Zealand	580	16.33	8.97	16.00	15.18	8.86	14.00	4.61	.000	.19
Central Asia	774	14.30	8.31	13.00	13.53	8.49	11.00	4.83	.000	.17
Eastern Asia	2 888	15.16	7.14	15.00	14.08	7.28	13.00	12.49	.000	.23
Eastern Europe	13 474	14.60	8.79	12.00	13.98	8.56	11.00	12.66	.000	.11
Latin America and the Caribbean	8 103	16.50	9.18	15.00	15.96	9.27	15.00	12.44	.000	.14
Northern Africa	4 395	15.05	7.60	18.00	17.03	8.97	20.00	-32.69	.000	-.49
Northern America	4 125	17.60	9.30	18.00	15.68	9.01	14.00	18.87	.000	.29
Northern Europe	4 219	13.74	8.43	11.00	12.39	7.84	10.00	14.79	.000	.23
South-Eastern Asia	3 325	17.09	9.36	17.00	15.43	8.84	14.00	16.44	.000	.29
Southern Asia	799	16.06	9.09	15.00	15.61	9.10	15.00	3.65	.000	.13
Southern Europe	10 466	12.89	8.19	10.00	12.86	8.25	10.00	3.13	.002	.03
Sub-Saharan Africa	1 829	18.99	11.00	18.00	18.76	11.20	18.00	3.69	.000	.09
Western Asia	9 391	12.90	8.87	10.00	13.13	9.00	10.00	-1.17	.242	-.01
Western Europe	4 664	13.21	7.88	11.00	12.96	7.82	10.00	4.42	.000	.06

Note. ASR-YWMS = Acceptance of Sugar Relationships in Young Women and Men Scale; ASR-OMWS = Acceptance of Sugar Relationships in Older Men and Women Scale.

Multilevel Modeling to Examine the Associations Between Individual- and Country-Level Predictors of the Acceptance of Sugar Relationships (H4)

We conducted Bayesian multilevel modeling to identify which model is the best among four candidates: the null model, fixed-effect model, random-intercept model, and random-slope model. The results of the model selection are presented in Table 6. For both the ASR-YWMS and ASR-OMWS, the random-slope model including all fixed effects, random intercepts, and random slopes was found to be best.

Table 6 *Model comparisons for Bayesian multilevel modeling*

logBFs	ASR-YMWS	ASR-OMWS
Fixed effects only vs. Null	10 256.52	9 117.87
Random intercepts vs. Null	12 344.81	11 122.24
Random slopes vs. Null	12 644.30	11 390.10

The results from Bayesian MLM are reported in Table 7.[Footnote 2] When the ASR-YWMS was examined as an outcome variable, we found several individual- and country-level predictors significantly predicting the dependent variable. At the individual level, sociosexual orientation (measured by the SOI-3), traditional gender roles (measured by the GEMS), and pathogen prevalence (measured by the nine-item Pathogen Prevalence Index) were positively associated with the ASR-YWMS.[Footnote 3] Interestingly, we found that being a woman positively predicted higher ASR-YWMS scores, while age negatively predicted it, opposite to our hypothesis. Collectivistic tendencies (measured by the Collectivism Scale) did not significantly predict the ASR-YWMS (H4.1).

Table 7 *Results from Bayesian multilevel modeling*

	Acceptance of Sugar Relationships in Young Women and Men Scale					Acceptance of Sugar Relationships in Older Men and Women Scale				
			95% Bayesian CI		BF			95% Bayesian CI		BF
	b	*SE*	Lower	Upper	(H1 vs. H0)	*b*	*SE*	Lower	Upper	(H1 vs. H0)
Intercept	-.04	.03	-.10	.02		.02	.03	-.03	.07	
Individual-level predictors										
Sex (Ref: men)	.03	.01	.02	.05	.00	-.06	.01	-.08	-.05	**Infinite**
Age	-.16	.00	-.17	-.15	.00	-.11	.00	-.11	-.10	.00
Sociosexual Orientation	.33	.01	.30	.35	**Infinite**	.29	.01	.27	.31	**Infinite**
Traditional gender roles	.08	.01	.06	.10	**Infinite**	.08	.01	.06	.10	**Infinite**
Collectivism Scale	.00	.01	-.02	.01	2.65	.01	.01	-.01	.02	2.94
Pathogen Prevalence	.03	.01	.02	.04	**3999.00**	.03	.01	.01	.04	**Infinite**
Country-level predictors										
HDI	.07	.05	-.03	.18	.09	.06	.05	-.03	.16	.11
Gender inequality	.06	.05	-.05	.16	**6.45**	.02	.05	-.07	.11	1.77
Ingroup favoritism	-.04	.03	-.10	.02	.12	.04	.03	-.02	.09	**8.59**
Parasite stress	.09	.04	.01	.18	**56.97**	.10	.04	.02	.17	**152.85**

At the country level, both gender inequality (measured by the Gender Inequality Index) and parasite stress (measured by the Country-specific zoonotic and non-zoonotic parasite stress) positively predicted the outcome variable. Collectivism (measured by the 178-nation index of Ingroup Favoritism) was negatively associated with the variable which was consistent with our hypothesis. However, the HDI was positively associated with the variable, contrary to our hypothesis (H4.2).

We also found several significant outcomes when the ASR-OMWS was analyzed. At the individual level (H4.3), sociosexual orientation, traditional gender roles, and pathogen prevalence were positively associated with the ASR-OMWS as hypothesized. Consistent with the hypothesis, women were less accepting of sugar relationships from the perspective of older resource providers. In contrast to the hypothesis, older people reported less acceptance of sugar relationships from both perspectives (ASR-OMWS and ASR-YWMS). Collectivism was not significantly associated with either score.

At the country-level (H4.4) parasite stress positively predicted the ASR-OMWS as we hypothesized. However, the HDI and ingroup favoritism were positively associated with the variable contrary to the hypothesis. The gender inequality did not show any significant association.

Discussion

The present study expands the existing knowledge of relationships involving exchanges of sex for resources in human mating. We contribute a cross-cultural comparative analysis of acceptance of sugar relationships across demographic, psychological, and cultural dimensions. Although many empirical studies of sex for resources have been conducted with geographically and culturally diverse samples, the present study is the first to provide comparative data on ASR scales (designed to explore attitudes from both the perspectives of potential companionship providers and resource providers) for 87 countries. Furthermore, we also examined and validated the ASR scales across different languages through the measurement invariance test and alignment. Researchers who intend to conduct cross-cultural and cross-national studies on the topic may employ the scales with measurement alignment. The study revealed several novel findings, which are discussed below.

Cross-Linguistic and Cross-Sexual Construct Equivalence, Internal Consistency (H1)

One aim was assessing the psychometric properties of the ASR-YWMS and ASR-OMWS with a large multinational sample. In order to compare the ASR scales with other psychometric instruments on a multilingual sample, it was necessary to test the linguistic invariance of all the

scales used. The findings demonstrate that all 37 translated versions of the two measures (except for the Persian version of the ASR-YWMS) show adequate psychometric properties in terms of factor structure, explained variance, internal consistency, and cross-linguistic construct equivalence. All translated versions of the two measures were expected to show cross-linguistic construct equivalence with the respective original measures and adequate psychometric properties in terms of factor structure, explained variance, and internal consistency (H1.1). Our findings suggest that the contents of the two five-item scales (and one exception each of their translated versions) adequately reveal the universal human mating psychology underlying the cultural diversity of ASR, and therefore may provide useful instruments in further cross-cultural comparative analyses. Our results also support the measurement invariance of the other instruments (the SOI-3, the GEMS, and the Individualism–Collectivism scale). These results support Hypothesis 1.1.

As there was no sex variance in the original ASR-YWMS and ASR-OMWS measures, it was necessary to control for sexual invariance in the actual multicultural sample. When testing for sexual invariance, we found that both ASR scales are consistent measures across men and women. These results support Hypothesis 1.2.

Sex Differences of the Acceptance of Sugar Relationships (H2)

The previously obtained sex differences in scores on ASR-YWMS and ASR-OMWS (men consistently being more accepting than women) were replicated in the present study. Men scored significantly higher on both measures (ASR-YWMS and ASR-OMWS) than women did. According to H2, the previously obtained cross-sex construct equivalences were expected with higher male scores on both ASR measures. Even though these results confirm Hypothesis 2, an interesting contradiction arises here that needs to be clarified. Indeed, in the theoretical introduction it was stated that "women prefer partners who are older and wealthier than themselves," which implies that women should be more open to sugar relationships from a companionship provider perspective (ASR-YWMS) than men. What could be the reason for this contradiction? The answer is probably multi-causal, as is the way the sex-for-resources encounter works. Our data confirm that participants perceive sugar relations as part of short-term mating (positive correlation with unrestricted sociosexuality). This may explain why men are more open to it, as several studies have found marked gender differences in sexual drive in the same direction (e.g., Buss & Schmitt, 1993, 2019; Frankenbach et al., 2022; Meskó et al., 2022a, 2022b, 2022c; Trivers, 1972; Walter et al., 2020). However, it should be noted that women who engage in sugar relationships also face significant peer stigma (e.g., Ernst et al., 2021; Grittner & Walsh, 2020; Johansson Wilén & Gunnarsson, 2023; Scull, 2022), which is also likely to

play a role in the higher rejection of this sexual activity among women compared to men. For a broader understanding of this phenomenon, it is worth considering that openness to sugar relationships is also associated with psychological variables such as egocentric sexual motivation, Ludus (playful) love style, higher subclinical psychopathy, and Machiavellianism scores (Birkás et al., 2020), which are associated with short-term mating strategy. We can probably better understand these sex differences in the acceptance of sugar relationships if we can consider individual differences in mating strategies and contextual influences (Gangestad & Simpson, 2000).

Intra- and Cross-Subregional Differences and Similarities (H3)

The socioeconomic context in which individuals form their attitudes and make their mating decisions is likely to affect their openness to sugar relationships. Since data from 87 countries were analyzed by 14 geographic subregions, we first confirmed measurement invariance across subregions in the ASR-YWMS and ASR-OMWS. These results support Hypothesis 3.1.

Since cultural factors may influence individuals' mating attitudes in different ways, we hypothesized that the degree of openness to sugar relationships may also vary by subregion. We found significant variation across subregions both in ASR-YWMS and in ASR-OMWS. These results support Hypothesis 3.2.

Given that each participant, irrespective of their actual age, completed both the ASR-YWMS and ASR-OMWS in the present study, the obtained data allowed for the exploration of possible subregional differences in the relative preferences for being a companionship provider (ASR-YWMS) vs. resource provider (ASR-OMWS). The related results consistently revealed significantly higher preference for being a companionship (vs. resource) provider, except in Western Asia where no difference was found between the two perspectives, and in North Africa where higher relative preference for being a resource provider was found. Finding a valid explanation for the results raises several difficulties. For example, the mean age of the Dutch sample was 49.50 years, while that of the Thai sample was 21.13 years (see Table S2 in Supplementary Materials). At the same time, the Dutch participants' mean scores on the ASR-YWMS and ASR-OMWS, respectively, were 13.95 and 13.40, while the respective scores were 23.90 and 23.88 in the Thai sample. That is, the differences are presumably due to cultural differences between the Thai and Dutch samples rather than to a lack of construct equivalence between the two translated versions of either the ASR-YWMS or the ASR-OMW (Brodeur et al., 2018; Krisch et al., 2019). These results support Hypothesis 3.3.

All these hypotheses (H3.1–3.3) were tested at the country level as shown in the online Supplementary Materials. The results at the country level were in general similar to those already found at the subregional level.

The first main set of questions (H1–3) of the present study dealt with the psychometric analysis of the ASR-YWMS and the ASR-OMWS. This revealed that both measures are characterized by reliability and measurement invariance in linguistic, sexual, and regional terms. The second main set of research questions (H4) was aimed at the associations between openness to sugar relationships and individual and cultural level predictor variables.

Associations with Individual- and Culture-Level Predictors (H4)

The Bayesian multilevel models revealed the predictive power of, and interactions among, regional, demographic, economic and cultural variables for the ASR-YWMS and the ASR-OMWS. According to H4, both ASR measures were expected to be associated positively with male sex, higher age, unrestricted sociosexuality, and higher parasite history, but negatively associated with individualism, gender equality, and social welfare. Overall, our results partially supported Hypothesis 4: there were some cases where we found no significant associations between the target and predictor variables, and in some cases, we found associations in directions opposite to the expected.

Individual-Level Predictors on Acceptance of Sugar Relationships with Younger Women and Men Scale

Openness to sugar relationships as sexual companionship provider (ASR-YWMS) was positively associated with unrestricted sociosexual orientation, identification with traditional gender roles, and prevalence of pathogens at the individual level. Contrary to our hypothesis, we found that being woman positively and age negatively predicted openness to sugar relationships. The collectivism variable (collectivistic personal values) did not significantly predict ASR-YWMS. These results partly support Hypothesis H4.1.

Previous research on ASR (Ipolyi et al., 2021; Láng et al., 2021; Birkás et al., 2020) had a methodological assumption that younger (18–28 years old) male participants could only complete the ASR-YWMS (due to their age). It is possible that the previous research unnecessarily constrained itself with this assumption. Indeed, it is possible that young men who completed the ASR-YWMS assumed that their current or decades older selves would pay for sex (and did not consider which side of this sexual transaction was targeted by the questionnaire offered to them). The method used in the present study (each participant completing both ASR-YWMS and ASR-OMWS) allowed respondents to judge the two aspects independently. That is, they could compare and decide which attitude (paying for sex or sex for payment) was more

characteristic of them. Our results showed that women were more accepting of being the younger partner in a sugar relationship (ASR-YWMS), but less accepting of being the older partner (ASR-OMWS), as expected. It is possible that these results reflect the typical age gap in the sugar relationship scenario: men are typically older, and women are typically much younger. This means that women might have a more positive attitude toward the role of "sugar baby" than men toward the role of "sugar boy". At the same time, women might have more negative attitudes toward the role of "sugar mommy" than men toward the role of "sugar daddy". Overall, although these results only partially support the hypotheses formulated based on previous research, they are in fact well interpretable in terms of the psychological functioning of sugar relationships. This expectation is based on the view that engaging in sex for resources is a general preference that is an essential part of the psychology of human mating. Women are more likely to prefer men who are older and wealthier than themselves, whereas men are more likely to prefer younger women (Walter et al., 2020, 2021).

Country-Level Predictors on Acceptance of Sugar Relationships with Younger Women and Men Scale

Openness to sugar relationships as sexual companionship provider (ASR-YWMS) was positively associated with both gender inequality and parasite stress at the country-level. Collectivism (collectivistic value by countries) was negatively associated with openness to sugar relationships, which is in line with our hypothesis. Contrary to our hypothesis, we found that HDI was positively associated with openness to sugar relationships. These results partly support Hypothesis H4.2.

The result on HDI shows that material well-being (higher HDI), rather than being negatively related to young people's openness to sugar relationships, was in fact positively related to it. This unexpected association raises some considerations. Although in the US-American and Danish studies (Groes et al., 2021; Scull, 2022) the most important motivation reported by participants in sugar relationships was money, our findings suggest that material resources may not be the most important motivation for being open to sugar relationships. Nevertheless, it is possible that material wealth may predict the extraction of material goods in countries with high HDI. Our results suggest that economic rationale may be significantly associated with individual decisions to buy and sell sex as a commodity (Mensah et al., 2022; Van der Veen, 2001). Whether individuals are driven by extrinsic or intrinsic motivations may also play a role. Ipolyi et al. (2021) found that scores on both the ASR-YWMS and ASR-OMWS were positively associated with extrinsic motivation focused on external values (e.g., financial success, social status, reputation, attractive appearance).

Individual-Level Predictors on Acceptance of Sugar Relationships with Older Men and Women Scale

Openness to sugar relationships as a resource provider (ASR-OMWS) was positively associated with unrestricted sociosexual orientation, identification with traditional gender roles, and prevalence of pathogens at the individual level. Consistent with our hypothesis, we found that being men positively predicted openness to sugar relationships. Collectivism (collectivistic personal values) did not significantly predict ASR-OMWS, not confirming our hypothesis. Contrary to our hypothesis, age negatively predicted openness to sugar relationships. These results partly support Hypothesis H4.3.

Collectivistic personal values showed no correlation with either ASR-YWMS or ASR-OMWS scores. A possible explanation is methodological. In this research, we used a collectivism scale (Wu, 2006) that can be measured primarily in the context of employment. Individualistic/collectivistic values in the work context are unlikely to be transposed one-to-one to the mating context. Future studies will be needed to test this explanation.**Country**

Level Predictors on Acceptance of Sugar Relationships with Older Men and Women Scale

Openness to sugar relationships as a resource provider (ASR-OMWS) was positively associated with parasite stress as hypothesized. However, HDI and ingroup favoritism was positively associated with the openness to sugar relationships, contrary to the hypothesis. Gender inequality index did not show any significant association. These results partly support Hypothesis H4.4.

The most striking positive association is between pathogen saturation and openness to sugar relationships. Both individual-level and country-level measures support the hypotheses on both ASR scales. These results support previous findings. Since sexual contact is an important route of human-to-human transmission of pathogens, promiscuous sexual behavior plays an explicit role in the spread of infections (Richard et al., 2017). The greater the prevalence of pathogens within a community, the greater the threat to that community's viability (Mackey & Immerman, 2000).

Cross-culturally, pathogen stress levels correlate within a culture and the prevalence of polygynous marriage systems, and monogamous mating systems are less common in cultures with high pathogen stress (Low, 1990; White & Burton, 1988). Research by Marlowe (2003) has also suggested that monogamy is more prevalent in forager cultures with low pathogen levels and where men contribute a significant proportion of calories to the local diet.

The most contradictory results come from the analysis between collectivism and ASR. While the personal collectivism value (collectivism scale) showed no association with any of

the ASR scales, country-level collectivism (ingroup favoritism) showed a negative association only with ASR-YWMS (as expected), but a positive association with ASR-OMWS. So, while collectivism is negatively correlated with young people's openness to participate in sex-for-resources, for older people it is positively correlated. This may relate to the differing typical age range for men and women in sugar relationships: the restrictive effect of collectivist values on female sex-for-resources behavior is well documented. For example, Li et al. (2022) found that female Chinese sex workers who faced stigma because of their activities were able to reduce the distress caused by stigma by attenuating their personal networks, which emphasized collectivist values. However, there is a paucity of literature on the collectivist norms associated with the purchase of sex.

An alternative explanation is that women's openness to engage in sex for resources in patriarchal societies is part of the "staying alive" strategy (Campbell, 1999). Since women's overt aggression in the competition for limited resources is usually disapproved (Benenson et al., 2022; Bleske-Rechek & Deaner, 2022; Campbell, 1999), they may employ alternative strategies. That is, survival motives may also have contributed to the emergence of female promiscuity (gaining men's resources by adapting to male promiscuity).

Limitations and Future Directions

Although we addressed possible explanations for the observed associations between openness to sex for resources and the tested predictors, due to the exploratory nature of the study, the findings cannot offer a full picture of the mechanisms via which the studied factors exert influence on one's attitude toward sugar relationships.

Moreover, because the sampling was convenience-based, disproportionalities sometimes emerged (e.g., the Dutch sample was on average twice as old as the Thai sample). These suggest that our results have limited validity when comparing national samples. Further studies will be needed to paint a more accurate picture.

One of the main questions of this research is whether openness to sugar relationships is related to promiscuity. The results show that both ASR scales are positively related to the SOI-3, thus replicating previous similar findings (Birkás et al., 2020; Láng et al., 2021). However, it should be noted that other research (e.g., Chu, 2023; Motyl, 2012) also reports that some sugar relationships are long-term relationships. In this respect, our results are of limited, as we found no evidence for a long-term strategy.

One anonymous reviewer of the manuscript suggested that when we decided to use a culturally specific term (sugar relationship) in the research rather than the broader concept of

"sex for resources" we may have made it difficult for some participants to understand the questionnaire. Although the results of the statistical analysis do not support this concern, we should consider the possibility that data are drawn from multiple countries, some of them might have already incorporated the idea of resource exchange into their mainstream understandings of relationships.

In this research, we did not take into account cultural differences in the acceptability of the explicitness of transactions described in ASR scales. Many intimate arrangements cross-culturally and throughout history were also about an exchange of resources, irrespective of the form of relationship. Our research does not focus on the question of how these other arrangements relate to the sugar relationships or what distinctions can be drawn between them. At the same time, there can be significant differences between cultures depending on the extent to which they have incorporated the "sex for resources" aspect into their mating rituals. Some cultures have long preferred marriages/ relationships that occur between individuals of similar social class or socioeconomic status; others have allowed for more mobility. Further, some cultures allow for an explicit consideration and discussion of the resources exchanged in a match (economic/financial/status in exchange for companionship/reproductive capacity, etc.) while others prefer not to speak of such considerations directly. However, these culturally embedded norms can also have an impact on attitudes measured on the ASR scales. These possible effects need to be clarified in future research.

Conclusions

The current research represents the largest investigation of predictors of openness to sugar relationships, testing the psychometric properties of ASR-YWMS and ASR-OMWS, based on data from 69,924 participants across 87 countries. As such, it takes an important step toward understanding the opening attitude toward participating in sex for resources, across cultures or demographic groups, alongside factors operating at the individual level. The main strength of this research is its cross-cultural nature and large sample size, which allows a systematic examining of the impact of individual and cultural variables and the factors that explain the greatest variation in openness to sugar relationships. We believe that a more nuanced understanding of the phenomenon of openness to sugar relationships will provide fundamental insights into the psychology of human mating and may translate into developing more effective ways to counteract the possible negative psychological consequences of participating in sex-for-resources type of encounters.

Data Availability

All data and Supplementary Materials have been made publicly available at the Open Science Framework (OSF) and can be accessed at https://osf.io/prdj2/?view_only=48e348faeac344a59554ad44c7e89482.

Notes

1. Following an anonymous reviewer's suggestion, we also conducted tests for H3s at the country level. First, we were able to achieve scalar invariance required for cross-country comparisons via measurement alignment (relevant to H3.1). Second, both the ASR-YWMS and ASR-OMWS reported significant cross-country differences as shown at the subregional level (relevant to H3.2). Third, we also examined the difference between the ASR-YWMS and ASR-OMWS in each country (relevant to H3.3). See "Additional Country-wise Analyses" section in our online supplementary material at https://osf.io/4umga?view_only=48e348faeac344a59554ad44c7e89482 or our OSF repository for further details.

2. One anonymous reviewer raised a concern about the possibility that the associations between several predictors at the individual level (e.g., collectivism) and dependent variables not supporting the hypothesis may be attributable to the shared variance across the individual and country levels. To examine whether that was the case, we tested the regression models without random slopes. The additional analyses reported that for both the ASR-YWMS and ASR-OMWS as dependent variables, the exclusion of the random slopes did not alter the analysis results regarding the individual-level predictors. Plus, the exclusion of ingroup favoritism at the country level also did not alter the results as well. See "Additional Analyses related to Multilevel Modeling" section in our online supplementary material at https://osf.io/4umga?view_only=48e348faeac344a59554ad44c7e89482 or our OSF repository for further details). Hence, we shall conclude that the potential shared variance across the different levels would not be a serious concern while interpreting the findings in Table 7.

3. Given that the SOI-3 consists of only three items and it demonstrated strong correlation ($r \geq .50$) with the variables of interest, we examined its incremental validity in the models via additional MLMs following one reviewer's suggestion. The results indicated that the inclusion of the SOI-3 significantly improved the regression models, so its

incremental validity was also significant. See "Incremental Validity of the Sociosexual Orientation" section in our online supplementary material at https://osf.io/4umga?view_only=48e348faeac344a59554ad44c7e89482 or our OSF repository for further details.

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3.5 Short-term Mating Orientation Predicts Openness to "Sugar Relationships" More Than Life History Strategy[12]

Norbert Meskó[1*], Jessica S. Ehlers[1], András N. Zsidó[1]

[1]Institute of Psychology, University of Pécs

*Corresponding author

Abstract

Life History Theory (LHT) suggests that individuals vary in their sexual, reproductive, parental, familial, and social behaviors in response to physical and social challenges encountered during development. So-called 'sugar relationships' generally involve exchanges of resources for sex and/or companionship between younger partners and older providers. This study aimed to explore the relationship between openness to sugar relationships and life history strategies. A total of 312 participants (192 women, 120 men) completed an extensive online questionnaire, including the Acceptance of Sugar Relationships for Young Women and Men Scale (ASR-YWMS), High-K Strategy Scale (HKSS), Multidimensional Measure of Sociosexual Orientation (MMSO), Family Resources Scale (FRS), Childhood Unpredictability Scale (CUS), and Perceived Vulnerability to Disease Scale (PVDS). The results indicate that openness to sugar relationships are primarily associated with short-term mating orientation, while the role of life history strategy appears to be weaker than previously assumed. Importantly, the SEM analysis revealed an indirect link between limited family resources in childhood and openness to sugar relationships mediated by a fast life history strategy. This pathway suggests that early environmental constraints may shape an adaptive orientation toward immediate resource acquisition in adult relationships. No such association was observed among men, indicating sex-specific patterns. These findings provide insight into how specific life-history strategies, particularly in women, may influence attitudes toward resource-based relationships, illustrating the nuanced interactions between early experiences, life-history orientation, and adult relational preferences.

Keywords: Life history strategy, Acceptance of sugar relationships, Short-term mating orientation, Family harshness, Family unpredictability, Exchanges sex for resources

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Introduction

Engaging in sexual relationships for material gain, such as becoming a concubine, mistress, or paramor, has been documented throughout human history (Murdock, 1952; Nelson, 1993; Ringdal, 2007; Sanger, 1858; Scott, 2014). The exchange of sex for resources is predominantly considered a short-term mating strategy in evolutionary psychology (Dylewski & Prokop, 2021; McGuire & Gruter, 2003). However, the significance of exchanging sex for resources extends beyond short-term contexts to include long-term mating contexts as well. In a long-term mating scenario, providing resources (e.g., emotional support, physical protection, and material assets) to a female sexual partner is an adaptive male behavior conducive to maintaining an emotionally committed long-term relationship, particularly in terms of parenting (e.g., Fajardo et al., 2022; Geary, 2015; Gettler et al., 2020; Marlowe, 2000). Similarly, women's responsiveness to men's resources in mating contexts is an adaptive preference that has likely contributed to female reproductive success and continues to impact intimate partner relationships (Buss & Schmitt, 1993, 2019; Conroy-Beam, 2019; Walter et al., 2020, 2021).

Sugar relationships represent a contemporary form of transactional sexual encounters, where the matching of demand and supply is further facilitated by algorithms of specialized dating sites (Birkás et al., 2020; Láng et al., 2021; Upadhyay, 2021). In these arrangements, a wealthy individual, typically a man (referred to as a 'sugar daddy') or less commonly, a woman ('sugar mommy'), provides material compensation, such as money or other assets, in exchange for companionship from an attractive younger, dependent partner ('sugar baby' or, less frequently, 'sugar boy'; Nayar, 2017).

According to the evolutionary psychology literature (Buss & Schmitt, 1993, 2019; Dylewski & Prokop, 2021; McGuire & Gruter, 2003; Walter et al., 2020, 2021), the association between male-provided resources and female sexual availability may confer adaptive advantages in both short- and long-term mating contexts. Therefore, it is necessary to clarify whether sugar relationships are better considered as part of short-term or long-term mating strategies. The phenomenon of sugar relationships organized through online platforms, or their Eastern equivalent, compensated dating (Chu, 2018), remains relatively new (Wade, 2009). Consequently, it is not entirely clear whether these can be regarded as long-term or short-term mating strategies. Some studies suggest a correlation between openness to sugar relationships and unrestricted sociosexuality (Birkás et al., 2020; Láng et al., 2021; Meskó et al., 2024), while Chu (2024) contends that compensated dating may evolve into long-term relationships. In light of these contradictory findings, it cannot be concluded whether the openness to sugar

relationship is part of a short-term or long-term mating strategy. Therefore, this study aims to answer this question.

Life History Theory (LHT) serves as a framework for understanding individual diversity in sexual, reproductive, parental, familial, and social behaviors across lifespans (see Figueredo et al. 2006; also see Del Giudice et al., 2016 for review). The LHT predicts adaptive variations in how organisms allocate limited time and resources to growth and reproduction. There are two main strategies: a slow life history, characterized by delayed sexual development and reproduction with investment in relatively fewer offspring, and a fast life history, characterized by earlier sexual maturity and greater offspring production with less investment per offspring. Each strategy provides a way for an organism to extract value from its environment, based on the physical and social challenges encountered.

While LHT provides a useful framework for understanding reproductive strategies, mating orientation, particularly short-term mating orientation (STMO), has also been identified as a key factor shaping individual differences in sociosexual behaviors. Sociosexuality, which includes openness to casual sex and transactional relationships, is strongly associated with short-term mating strategies (Jackson & Kirkpatrick 2007; Simpson et al. 2012). Given that sugar relationships involve a structured exchange of sex and resources, they may be better understood in the context of mating orientation, rather than broader life history adaptations. Therefore, it is crucial to examine whether openness to sugar relationships are primarily influenced by life history strategies or short-term mating motives.

In stable environments (e.g., high socioeconomic status and low mortality rate), delayed and restricted reproduction channels resources into fewer offspring, whereas in unpredictable environments, accelerated reproduction mitigates the potential risk of overinvestment in a single child.

While some recent studies have questioned the applicability of LHT to human trait variation (e.g., Nettle & Frankenhuis, 2019; Zietsch & Sidari, 2019), it remains valuable for studying psychosocial developmental plasticity, particularly in disadvantaged environments (Kuzawa & Bragg, 2012). Previous studies have shown that low socioeconomic status (low family income, low level of education, etc.) in childhood is associated with higher levels of impulsivity, elevated risk-taking, unrestricted sexuality, and poorer social skills (Belsky et al., 2010; Brumbach et al., 2009; Cabeza de Baca et al., 2016; Griskevicius et al., 2011a; Nettle, 2010). Socioemotional development is also shaped by childhood conditions, such as the quality of family functioning (e.g., communication in the family, parental support) and parental care (Belsky et al., 2012; Ellis, 2013). More adverse circumstances (e.g., absence of a father, higher levels of

conflict in the family) generate more hedonistic, opportunistic, hostile, and antagonistic interpersonal styles, and impair social and emotional intelligence (Brumbach et al., 2009; Cabeza de Baca et al., 2016; Hurst & Kavanagh, 2017; Jonason et al., 2017). These traits confer advantages in harsh, unpredictable environments by aiding individuals to competitively capitalize on limited resources, suggesting that, in relatively unpredictable futures, investing effort into immediate rewards may offer a more successful survival strategy than gradual, long-term investments (Ellis & Del Giudice, 2019; Pepper & Nettle, 2017).

According to the Life History Theory (Ellis et al., 2009; Kaplan & Gangestad, 2005), traits associated with transactional sexual relationships are indicators of a faster life history (LH) strategy (see Csathó & Birkás, 2018). LH strategies involve resource allocation patterns configured to adjust to local conditions and optimize adaptive behaviors, such as mating or parental investment (Bjorklund & Ellis, 2014; Ellis et al., 2009; Kaplan & Gangestad, 2005). These resource expenditure sequences may be positioned in the dimension of slow-to-fast strategies (Del Guidice et al., 2016). Slow LH strategies are characterized by the ability to delay gratification, future/long-term focused behavioral strategies, and better quality of parental care (i.e., larger investment of time and effort in each offspring). In contrast, individuals with faster LH strategies possess a more present/short-term oriented attitude, including opportunistic, impulsive, and self-beneficial behaviors, a higher frequency of mating at a younger age, and little investment in social relationships or offspring (Ellis et al., 2009; Griskevicius et al., 2011b; Nettle, 2010). These findings support the idea that mate preferences are influenced by environmental factors, and that individuals may prioritize traits that maximize survival and stability based on context.

Little et al. (2007) found that human preferences for facial masculinity change depending on relationship type and environmental conditions. Women tend to prefer masculine male faces in short-term relationships, especially when resources are scarce, reflecting a potential preference for high-quality genetic traits in uncertain environments. However, for long-term relationships, both men and women preferred faces that indicated lower masculinity (for men) or femininity (for women) under harsh environmental conditions. This aligns with a strategy that favors partners who are more likely to invest in a committed relationship when resources are limited. Conversely, in safer environments, there is less emphasis on such investment qualities, allowing for greater flexibility in facial masculinity preferences across relationship types.

Traits associated with short-term-oriented behaviors are also related to certain elements of faster LH strategies (McFarlane et al., 2005; Young et al., 2017). For example, impulsivity, openness to experiences (e.g., sensation seeking, dominance), and some facets of extraversion

have been found to be associated with increased instability in romantic relationships, unrestricted sociosexuality, promiscuity, and self-beneficial behaviors such as exploitativeness and manipulation (Del Giudice, 2012, 2014). Such present-focused behavioral strategies are beneficial for individuals in harsh and unpredictable (i.e., less stable) environments because they enable them to maximize immediate benefits. Accordingly, personal and behavioral characteristics associated with transactional sexual relationships may be beneficial or adaptive under certain circumstances.

Based on the literature presented in the theoretical introduction, openness to sugar relationships is likely associated with a fast life history strategy and a short-term mating orientation (Birkás et al., 2020). Since life history strategy is typically influenced by adverse early life experiences, family harshness and family unpredictability are also expected to correlate with a fast life history strategy (Del Giudice, 2014). Finally, as previous findings (Meskó et al., 2024) suggest that pathogen exposure is positively associated with openness to sugar relationships, perceived vulnerability to disease is likely to be associated with openness to sugar relationships.

Current Study

The aim of this study was to explore the relationship between openness to sugar and life history strategies. Building on previous findings by Edlund et al. (2023), who found that one group engaged in sex work adopted a fast life history strategy compared to the non-sex worker control group, we hypothesize that life history events also influence openness to sugar relationships.

Scientific investigation of sugar relationships primarily involves studying individuals engaged in such relationships (Gunnarson & Strid, 2022; Scull, 2022). However, Birkás et al. (2020) recently suggested that if "access to female sexuality in exchange for male resources" is an adaptive trait of human mate choice, then there are individual differences in attitudes toward sugar relationships. Individuals who are more open to sugar relationships differ in various psychological traits from those who are less open to participating in these relationships.

Since sugar relationships are based on an arrangement in which the older party provides resources and the younger party provides companionship, researchers have developed scales to measure them from both perspectives. We chose the version intended for younger individuals, the Acceptance of Sugar Relationships in Young Women and Men Scale (Birkás et al., 2020) over the version intended for older individuals (Láng et al., 2021).

We measured life history using a self-report measure, the High-K Strategy Scale (HKSS; Giosan, 2006). Overall, we predicted that individuals who have a negative attitude toward sugar

relationships (as reflected by low scores on the Acceptance of Sugar Relationships in Young Women and Men Scale) would report having a slower life history than those who are more open to participating in sugar relationships (as reflected by high scores on ASR-YWMS).

We also considered childhood conditions using Indicators of Childhood Conditions (Family Resources and Family Unpredictability; Griskevicius et al., 2011a,b). Environmental harshness and childhood experiences have been shown to predict life history strategies in adulthood, potentially influencing mating behaviors (Kaighobadi et al., 2021). The acquisition of consistent information about predictability and harshness or their absence may be encoded through adaptive heuristics that are particularly receptive to childhood environmental feedback. We anticipated a positive correlation between openness to sugar relationships and the levels of unpredictability and harshness experienced in childhood.

Sociosexuality was assessed using the Multidimensional Measure of Sociosexual Orientation (MMSO; Jackson & Kirkpatrick, 2007). For the measurement of sociosexuality, we used the MMSO because it assesses interest in short- and long-term relationships separately. This allowed us to examine whether individuals who are more open to sugar relationships are not only more interested in casual sex than those who are less open to such encounters but also whether they are relatively less interested in long-term committed relationships. Although the former has been extensively studied (Birkás et al., 2020; Láng et al., 2021; Meskó et al., 2024), the latter has not been well documented. We also expected that individuals who are more open to sugar relationships would exhibit higher levels of sexual promiscuity (such as unrestricted sociosexuality) than those who are less open to sugar relationships.

We assessed self-perceived sensitivity towards infectious diseases using the Perceived Vulnerability to Disease Scale (PVDS; Duncan et al., 2009). 5. In a recent study on ASR, Meskó et al. (2024) found that openness to sugar relationships as sexual companionship providers (ASR-YWMS) is positively associated with the prevalence of pathogens, as reported by individuals based on their personal pathogen history. Although the health status of nearly 70,000 survey participants was highly diverse, with respondents from 87 WEIRD and non-WEIRD countries, we expect that, in our study, perceived vulnerability to disease will be positively correlated with openness to sugar relationships among Hungarian participants with advanced health status.

We hypothesized that family resources and unpredictability are positively associated with a slow life history strategy. Furthermore, slow life history strategy was negatively associated with short-term mating orientation. Additionally, a slow life history strategy was negatively associated with openness to sugar relationships, whereas a short-term mating orientation was

positively associated with openness to sugar relationships. However, given prior findings on the role of sociosexuality in shaping mating behaviors, we also considered the possibility that short-term mating orientation would be a particularly strong predictor of openness to sugar relationships, potentially playing a more significant role than life history strategy itself.

Given that men and women typically pursue different motives in relationships, with men typically preferring attractive young partners and women seeking older partners with good financial prospects (Walter et al., 2020), the dynamics of sugar relationships resemble a fundamental aspect of human mating contexts.

Methods

Participants and Procedure

Out of 345 participants who gave their consent to participate in the survey, 312 passed the attention check, and their data were included in further analyses. Based on their sex at birth, 120 participants identified themselves as male (38.5%) and 192 identified themselves as female (61.5%). Their ages ranged from 18 to 50 years (M = 22.83, SD = 4.91).

To assess sexual orientation, we used the Kinsey scale, supplemented with the "asexual" response option. The distribution of sexual orientation was asexual (not at all or not really interested in sex): 3 (1.0%), exclusively heterosexual: 252 (80.8%), predominantly heterosexual, only occasionally homosexual: 42 (13.5%), predominantly heterosexual, more often than occasionally homosexual, 2 (0.6%), equally heterosexual and homosexual: 4 (1.3%), predominantly homosexual, only occasionally heterosexual: 4 (1.3%), exclusively homosexual: 5 (1.6%).

Participants were asked to indicate the total number of sexual partners on a nine-point scale, with the following responses: 0: 60 (19.2%), 1: 69 (22.1%), 2: 29 (9.3%), 3: 34 (10.9%), 4: 19 (6.1%), 5-6: 35 (11.2%), 7-9: 22 (7.1%), 10-19: 24 (7.7%), 20 or more: 20 (6.4%). A total of 263 (84.3%) participants reported that they were university students, and 49 (15.7%) reported that they were not.

The distribution of recorded residential locations was as follows: 33 (10.6%), large village: 23 (7.4%), medium-sized village/small town: 67 (21.5%), county seat city/large town: 119 (38.1%), and capital city and its surroundings: 70 (22.4%). According to the reported relationship statuses, 135 (43.3%) participants were single without any relationships, 20 (6.4%) were single and had casual sexual relationships (or flings), 5 (1.6%) were involved in a committed relationship but had casual sexual encounters with others, 82 (26.3%) were involved in a committed relationship but not in a cohabitation relationship or married, and 70 (22.4%) were in a cohabitation relationship or married.

An online survey was conducted using the Qualtrics software. The survey link was sent to the university student mailing list of the authors and posted on the university's social media sites. The research plan was approved by the Hungarian United Ethical Review Committee for Research in Psychology under the Reg. No. EPKEB 2020/02. The ethics committee followed all relevant international ethical guidelines and regulations for research involving human participants in accordance with the Declaration of Helsinki (Rickham, 1964) and the Ethical Principles of Psychologists and Code of Conduct published by the American Psychological Association (APA, 2002). All participants provided informed consent for participation in the survey.

Transparency and Openness

The study followed the Journal Article Reporting Standards (JARS; Kazak, 2018), detailing the sample size determination, data exclusions, manipulations, and all procedures. Access to all data, analysis code, and research material is available at: https://osf.io/vnbcx/?view_only=d281cdfa534f4f4995e6481d40387601. Data were analyzed using R, version 4.0.0 (R Core Team, 2020). For a comprehensive analytical methodology, please refer to the section titled Analytic Plan. The study design and analysis were not preregistered.

Measures

The first author translated all questionnaire items and instructions into Hungarian, except for ASR, which was originally developed in Hungarian. The translated versions were verified for consistency using the back-translation method (Brislin, 1970, 1983; Hambleton & De Jong, 2003; Muñiz et al., 2013). This involved retranslating the items and instructions back into English by a translator independent of the study. Minor discrepancies identified during the back-translation process were addressed by the two translators.

Acceptance of Sugar Relationships in Young Women and Men Scale (ASR-YWMS)

The ASR-YWMS (Birkás et al., 2020) is a five-item scale assessing willingness to engage in a sugar relationship as the younger partner (sugar baby/boy), offering sexual companionship to an older partner in exchange for material compensation (gifts and/or money). The original ASR was developed in Hungarian. Examples of items include: “If it would benefit my career, I would think about engaging in a sugar relationship”; “I would seriously consider engaging in a sugar relationship if I thought it would help me have a better financial situation.” The participants rated each item on a seven-point scale ranging from 1 (completely disagree) to 7 (completely agree). Higher scores indicate an inclination to participate in sugar relationships. In the present study, the McDonald's ω for the ASR-YWMS was 0.931.

Multidimensional Measure of Sociosexual Orientation (MMSO)

Two attitudinal aspects of sociosexual orientation were measured using items from the MMSO (Jackson and Kirkpatrick, 2007; α = 0.643): (1) Short-term Mating Orientation (STMO; 10 items, e.g., "I can easily imagine myself being comfortable and enjoying 'casual' sex with different partners") and (2) Long-term Mating Orientation (LTMO; seven items, e.g., "I am interested in maintaining a long-term relationship with someone special"; anchors: 1 = strongly disagree, 7 = strongly agree). Confirmatory factor analysis indicated an acceptable fit for the Hungarian adaptation of the MMSO (x2/df = 2.345, CFI = 0.997, TLI = 0.993, RMSEA = 0.069, SRMR = 0.082). Higher average scores on both measures indicate a greater preference. The McDonald's ω values for the two scales were STMO = 0.939 and LTMO = 0.911.

High-K Strategy Scale (HKSS)

The HKSS (Giosan, 2006) is a 26-item questionnaire that assesses a variety of high-K (slow) reproductive strategy indicators. Confirmatory factor analysis indicated an acceptable fit for the Hungarian adaptation of the HKSS (x2/df = 1.657, CFI = 0.950, TLI = 0.951, RMSEA = 0.046, SRMR = 0.072). The HKSS [supposedly] assesses life history qualities such as health and attractiveness (e.g., "I don't have major medical problems," "I am in good physical shape"), upward social mobility (e.g., "My training and experience are likely to bring me opportunities for promotion and increased income in the future"), social capital (e.g., "If something bad happened to me, I'd have many friends ready to help me"), and risk avoidance (e.g., "I live in a comfortable and secure home"; anchors: 1 = strongly disagree, 5 = strongly agree). Higher average scores indicated a slower life history strategy. McDonald's ω for the HKSS in this study was 0.840, indicating good internal consistency.

Harshness in Childhood

Childhood harshness experience was measured using the Family Resources Scale (FRS; Griskevicius et al., 2011a). Confirmatory factor analysis indicated an acceptable fit for the Hungarian adaptation of the Family Resources Scale (x2/df = 1.258, CFI = 0.999, TLI = 0.994, RMSEA = 0.029, SRMR = 0.034). This self-report instrument measures retrospective information about respondents' childhood family resources using eight items. Respondents evaluated the support provided by their family during their upbringing, including aspects such as spending money, food, clothing, time, and attention. Each item was rated on a 5-point scale from "Inadequate support" (1) to "Exceptional support" (5). Lower scores indicated a more difficult childhood environment. The FRS demonstrated good internal consistency in the present study with a McDonald's ω of 0.892.

Unpredictability in Childhood

Unpredictability in childhood was assessed using the Childhood Unpredictability Scale (CUS; Griskevicius et al., 2011b). This self-report instrument measures retrospective information about the predictability of a respondent's childhood family environment using three items. Respondents indicated their level of agreement with statements such as "People often moved in and out of my house on a pretty random basis" and "Things were often chaotic in my house." Each item was rated on a 7-point scale from "Disagree" (1) to "Agree" (7). Higher scores indicated a less predictable childhood environment experienced by an individual. McDonald's ω for CUS in the present study was 0.735.

Perceived Vulnerability to Disease Scale (PVDS)

The PVDS (Duncan et al., 2009) is a 15-item self-report questionnaire designed to measure chronic concerns regarding susceptibility to infectious disease transmission. Confirmatory factor analysis indicated an acceptable fit for the Hungarian adaptation of the PVDS (x2/df = 3.119, CFI = 0.982, TLI = 0.971, RMSEA = 0.085, SRMR = 0.074). Factor analyses, as reported by Díaz et al. (2016) identified two dimensions: Perceived Infectability (e.g., "I am more likely than the people around me to catch an infectious disease") and Germ Aversion (e.g., "I dislike wearing used clothes because you do not know what the last person who wore it was like"). Participants rated each item on a 7-point scale, ranging from "strongly disagree" to "strongly agree". Higher average scores indicated greater perceived vulnerability. In the present study, McDonald's ω coefficient for the two scales were: Perceived Infectability: 0.888; Germ Aversion: 0.745.

Analytic Plan

First, we assessed the distribution of each variable to determine if there was a normal distribution, with skewness and kurtosis falling between -2 and 2. Only one variable, LTMO, deviated from this. To address this, we use a Box-Cox transformation ($\lambda = 3$) to achieve a normal distribution.

Then, we used general linear Modelling (GLM) to test which measured variables were significant predictors of ASR scores. The independent predictors in the model were HKSS, Family Resources, Unpredictability, STMO and LTMO, and PVD Infectability and Germ Aversion. Multicollinearity was not a concern in the model (VIF values were below 4), and the normality of the residuals was not violated (Kolmogorov-Smirnov p = 0.166), which was confirmed through visual inspection of the Q-Q plot. The statistical results are presented in tables for clarity and ease of interpretation.

Table 1 *Results of the GLM analysis, the presented values are standardized estimates (β)*

	df	F	p	β
Model	15, 281	7.8301	< .001	
HKSS	*1, 281*	*6.2209*	*0.013*	*-0.1563*
Family resources	1, 281	0.7186	0.397	0.0604
Family unpredictability	1, 281	2.09e-4	0.988	-8.91e−4
STMO	*1, 281*	*75.1952*	*< .001*	*0.5061*
LTMO	1, 281	0.8076	0.370	-0.0510
PVD Infectability	1, 281	0.0531	0.818	0.0141
PVD Germ aversion	1, 281	0.0514	0.821	0.0125
Sex	1, 281	3.8546	0.051	0.2248
HKSS ✻ Sex	1, 281	0.1318	0.717	-0.0455
STMO ✻ Sex	1, 281	0.8181	0.367	0.1056
Family resources ✻ Sex	1, 281	0.8081	0.370	-0.1281
Family unpredictability ✻ Sex	1, 281	0.3111	0.578	0.0688
LTMO ✻ Sex	1, 281	0.0732	0.787	-0.0307
PVD Infectability ✻ Sex	1, 281	0.2700	0.604	-0.0637
PVD Germ aversion ✻ Sex	1, 281	0.5444	0.461	0.0814

Note: ASR = Acceptance of Sugar Relationships in Young Women and Men Scale; HKSS = High-K Strategy Scale; Family Resources = Family Resources Scale; Family Unpredictability = Childhood Unpredictability Scale; STMO = Short-term Mating Orientation; LTMO = Long-term Mating Orientation; PVD Infectability = Perceived Vulnerability to Disease Scale Perceived Infectability; PVD Germ Aversion = Perceived Vulnerability to Disease Scale Germ Aversion

Next, given that we have specific predictions regarding the relationships between variables, we also utilized a more comprehensive method, structural equation modeling (SEM) which we based on the results of the previous GLM analyses. The achieved ASR scores were entered into the model as outcome variables, whereas HKSS, STMO and Family Resources and Unpredictability were included as predictor variables. The proposed model is illustrated in Fig. 1. For SEM analysis, we use the diagonal weighted least squares (DWLS) estimator. To assess the model fit, we used the relative chi-square ($\chi 2$/df), comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean square residual index (SRMR). The cut-offs for good model fit were a relative chi-square of 3 or less, CFI and TFI values of 0.95 or greater, and RMSEA and SRMR values of 0.08 or less. The SEM model was tested using the JASP statistical software version 0.16.3 for Windows, using the lavaan package for R.

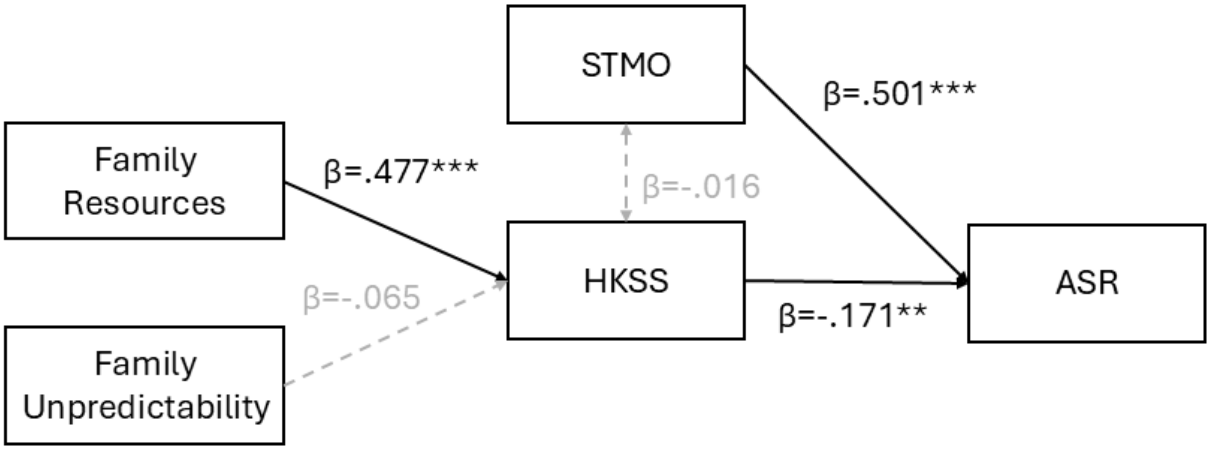
To examine whether sex plays a role in predicting openness to sugar relationships, we included it as an independent variable in the SEM model.

Results

First, we sought to test which variables emerged as independent predictors of the acceptance of engaging in transactional relationships. Table 1 presents the results of the GLM analyses, illustrating the relationships between ASR and its predictors (STMO, HKSS, and childhood unpredictability). The model confirms that STMO is the strongest predictor, with HKSS showing a weaker, although still significant, effect. GLM analysis showed a significant model fit, explaining 26.7% of the total variance. Table 1 presents detailed statistical results. Two significant independent predictors were identified in the model. The HKSS had a weak negative effect, whereas STMO had a strong positive effect on the ASRS score. This suggests that individuals with a stronger short-term mating orientation are more open to sugar relationships, whereas those with a slower life-history strategy tend to be less accepting of such arrangements. However, the effect size for STMO was notably larger than that for HKSS, reinforcing the dominant role of sociosexuality over life history strategy. These findings align with prior research on mating strategies, suggesting that openness to transactional relationships is more closely linked to individual differences in sociosexuality than childhood environmental factors. In conclusion, we confirmed that early experiences of unpredictability and short-term mating orientation predict greater acceptance of engaging in transactional relationships.

The test yielded a good model fit ($\chi 2/df = 1.04$, $p = 0.384$, CFI = 0.999, TLI = 0.997, RMSEA = 0.028, 90% CI = [0.000–0.092], SRMR = 0.012). The HKSS ($R2 = 0.264$) was positively associated with Family Resources, while the association with Family Unpredictability was non-significant. ASR ($R2 = 0.282$) was positively associated with STMO and negatively associated with HKSS, as expected, based on the GLM results. These results further support the idea that short-term mating orientation is the primary driver of openness to sugar relationships. While life history strategy plays a role, its effect is relatively weak, particularly compared to STMO. Figure 1 visually depicts the strength of these associations, highlighting the robust link between the STMO and ASR. Additionally, Table S3 in the Supplementary Materials provides full statistical details, including exact point estimates, standard errors (SE), standardized coefficients (ß), z-values, and p-values. Readers should note that the association between STMO and HKSS was non-significant, suggesting that these two constructs operate independently in predicting openness to transactional relationships.

Figure 1 *The model we tested on the potential contributors of ASR based on the GLMs. All pathways are displayed. Statistically significant pathways are highlighted in black (* p < 0.05, ** p < 0.01, *** p < 0.001). All reported estimates are standardized point estimates. Grey lines indicate nonsignificant pathways.*



Note: ASR = Acceptance of Sugar Relationships in Young Women and Men Scale; HKSS = High-K Strategy Scale; Family Resources = Family Resources Scale; Family Unpredictability = Childhood Unpredictability Scale; STMO = Short-term Mating Orientation

The association between STMO and HKSS was insignificant. For the exact ß values see Figure 1 and for all statistical values, including the point estimates, standard errors (SE), ß values, z values, and p-values (see Table S3 in Supplementary Materials).

Contrary to our initial expectations, short-term mating orientation (STMO) emerged as the strongest predictor of ASR, with a substantially greater effect than life history strategy (HKSS). This pattern was consistently observed across both GLM and SEM analyses, indicating that openness to sugar relationships is more strongly tied to short-term mating motives than to broader life-history strategies. These findings suggest that openness to transactional relationships is primarily a function of sociosexuality rather than a direct consequence of childhood environmental conditions or broader reproductive strategies. While early environmental unpredictability may contribute to some extent, its effects are mediated by individual differences in mating orientation. Future research should explore whether additional psychosocial variables, such as attitudes toward casual sex or relationship commitment, further explain the variation in the ASR.

To examine the potential effect of sex on ASR, sex was included as an independent variable in the SEM model. However, the path from sex to ASR was not significant (β = -.054, p = .362), indicating that openness to sugar relationships was not directly predicted by participant sex. When sex was included as an independent variable in the SEM model, it did not emerge as a significant predictor of ASR (β = -.054, p = .362). This finding suggests that greater openness

to sugar relationships is not systematically higher in one sex than in the other when controlling for other predictors.

Discussion

Our study examined the relationship between life history strategies and attitudes towards engaging in resource-based sexual exchanges with older, wealthier individuals. Consistent with our hypotheses, SEM analysis revealed that openness to sugar relationships were associated with a fast life history strategy and short-term mating orientation. Although the descriptive patterns suggested potential sex differences, our statistical analyses did not confirm a significant interaction between sex and these predictors. Specifically, openness to sugar relationships (ASR) in women correlates positively with short-term mating orientation (STMO) and fast life history strategy (indicated by low HKSS scores) and negatively with long-term mating orientation (LMTO scores). For men, ASR was associated only with short-term mating orientation, suggesting divergent relational patterns across the sexes.

The SEM model clarifies that although no direct association emerged between harsh childhood environments and openness to sugar relationships, life history strategy may act as a mediator between these factors. Women reporting lower family resources during childhood tend to exhibit a faster life-history strategy, which is subsequently linked to greater openness to sugar relationships. This mediated pathway highlights a nuanced connection between early environmental conditions and adult relational preferences, supporting the life history theory perspective that individuals raised in harsh environments may prioritize immediate rewards as an adaptive survival strategy (Ellis & Del Giudice, 2019).

Our findings indicate that short-term mating orientation (STMO) is a far more substantial predictor of ASR than life history strategy (HKSS). While we initially hypothesized that life history events would significantly shape openness to sugar relationships, our results suggest that attitudes toward these relationships are more closely linked to sociosexuality than broader life history strategies. This finding aligns with prior research that emphasizes the role of mating orientation in shaping partner preferences and sexual decision-making. These results challenge the assumption that openness to sugar relationships primarily reflects a fast life-history strategy, instead highlighting the dominant influence of short-term mating motives.

Our findings align with those of previous research indicating that stressful childhood conditions can increase the likelihood of short-term mating strategies (Salmon et al., 2016). Harsh, unpredictable environments are often characterized by lower socioeconomic backgrounds, where job instability, parental stress, and frequent household changes create greater

unpredictability (Belsky, 2007). Exposure to these conditions may predispose individuals to emphasize immediate resource gains over long-term investments, in line with a rapid life history strategy (Griskevicius et al., 2011a).

Although descriptive trends suggested potential sex differences in how life history strategies relate to ASR, our statistical models did not confirm significant interaction effects. Thus, while women's reproductive investment might make female sexual availability a valuable resource within the mating market (Trivers, 1972; Pawłowski & Dunbar, 1999) and men's ASR scores were linked only to short-term mating orientation, these patterns should be interpreted with caution, as the differences were not statistically robust.

Women's reproductive investment tends to make female sexual availability a valuable resource in the mating market (Trivers, 1972; Pawłowski & Dunbar, 1999). Consequently, women with a fast life history strategy may be more inclined to engage in exchanges where resource acquisition is linked to sexual availability, consistent with predictions from the sexual strategies theory (Buss & Schmitt, 1993, 2019). For men, ASR may represent an opportunity for increased short-term mating encounters rather than resource acquisition, explaining the limited association with life-history strategies.

However, we acknowledge that our measures of environmental harshness and unpredictability do not precisely align with the definitions established by Ellis et al. (2009). While Ellis et al. conceptualized harshness as objective mortality and morbidity rates, our scales assessed family support and housing stability. These distinctions may impact the interpretation of our findings, and we address this limitation in detail in the limitations section.

Moreover, methodological considerations may have influenced our findings. Previous studies on ASR, carried out by Meskó et al. (2024), typically restricted the ASR-YWMS survey to younger males (aged 18–28 years) due to their age. This assumption may have been unnecessarily restricted and influenced previous research. In addition, young men completing the ASR-YWMS may have anticipated their future selves, possibly decades older, engaging in transactions in which they would pay for sex rather than someone who is paid for sex. In other words, there is the possibility of a methodological error where young men may have misunderstood the role of "sugar boy" accurately.

In conclusion, our findings suggest that openness to sugar relationships are associated with both short-term mating orientation and fast life history strategy. Although descriptive women appeared to show stronger associations with these predictors, our statistical models did not confirm any significant sex-related differences. Therefore, while theoretical perspectives on sex differences in mating strategies remain relevant, future research should further investigate

these patterns using more refined methods. We speculate that this association may explain the preference for short-term mating goals among women who reported a faster life history strategy. These findings support previous reports (Birkás et al., 2020; Láng et al., 2021; Meskó et al., 2024) that openness to sex for resources, specifically sugar relationships, may be part of a short-term mating strategy, possibly shaped by experiences from the childhood environment. Birkás et al. (2020) identified a positive correlation between young participants' (aged 18-28) favorable perception of sugar relationships (ASR-YWMS) and characteristics indicative of a manipulative, game-playing love style (Ludus), self-centered sexual motivation, an unrestricted sociosexual orientation, and socially aversive personality traits encompassing Machiavellianism and subclinical psychopathy (both constituents of the Dark Triad), along with borderline personality organization. These traits are advantageous in harsh, unpredictable environments because they enable individuals to competitively capitalize on limited resources. In such environments, where the future is relatively unpredictable, investing effort in immediate rewards may be a more successful survival strategy than long-term investments that pay off more gradually (Pepper & Nettle, 2017; Ellis & Del Giudice, 2019).

Limitations

This study has several limitations. First, our reliance on self-reported measures assumes that respondents have conscious access to their subjective childhood, social, and sexual experiences, which may not be accurate for all individuals. Second, self-reported data are potentially susceptible to social desirability biases: respondents may underreport socially undesirable experiences (e.g., lack of family support or unmet needs) and overreport socially desirable experiences (e.g., a positive family environment). Moreover, participants may have been inclined to present themselves in alignment with their social stereotypes. Third, as one anonymous reviewer pointed out, the study has methodological limitations, particularly in operationalizing the constructs of harshness and unpredictability. Ellis et al. (2009) conceptualize harshness as the objective level of environmental mortality and morbidity, yet studies often operationalize harshness inconsistently, using variables like socioeconomic status or subjective perceptions of mortality risk. In this study, the "Harshness in Childhood" scale measured material and emotional family support, which does not fully align with Ellis et al.'s (2009) definition. Similarly, for unpredictability, Ellis et al. defined it as a variation in mortality and morbidity. By contrast, the "Unpredictability in Childhood" scale in this study captures the frequency of childhood relocations, which may not fully capture the intended conceptual framework. Our analyses did not reveal significant interaction effects between sex and predictors of ASR, suggesting that sex

differences in these associations should be interpreted with caution. Future studies should explore these potential differences by using larger samples and alternative statistical approaches.

Conclusions

This study highlights the relationship between openness to sugar relationships, a specific type of encounter involving exchanges of sex for resources, and life history strategies. The findings indicated that a faster life history strategy may be associated with openness to sugar relationships, but this association was observed only in women. This may also mean that young women with adverse childhood experiences are vulnerable to short-term relationship opportunities and immediate financial rewards.

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Declaration of Conflicting Interests

The Authors declare that there is no conflict of interest.

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Life History Strategy and Openness to "Sugar Relationships"

Supplementary Materials

Network analysis

During the peer-review based on the comments of one of the reviewers, we decided not to include the network analysis we conducted in the original version of the manuscript. Instead, we replaced it with a Structural Equation Model approach to provide a clearer and more accurate understanding of the associations between preference for sugar relationships and life history strategy. Since we think that the results of the network analysis could still be of interest for future research, we present it in this supplementary material.

Method

We investigated the relationship between all variables using network analysis, which represents variables as nodes and their relationships as edges. Edge weight represents the strength of association between nodes. To estimate edge weights we used a regularized partial correlation approach known as Graphical Least Absolute Shrinkage and Selection Operator (glasso). This approach filters out weak correlations and false positive associations resulting from partial correlational analyses. We applied the extended Bayesian information criterion (EBIC) glasso for the network analysis with a hyperparameter set at 0.5. In the resulting network graph, blue denotes a positive, while red indicates a negative relationship between two nodes. The thickness of the line reflects the strength of the relationship between two variables, and nodes with similar characteristics are also positioned closer together. Statistical description includes edge weights (similar to correlational values) and centrality measures such as strength (also called degree) and expected influence. Edge weights can be interpreted using Cohen's effect size guidelines for correlation values (weak below 0.1, medium up to 0.3, and strong over 0.5). Degree represents the sum of all direct associations of a node with other nodes, reflecting the direct influence a given node has on the network. Expected influence is the absolute sum of edge weights associated with the node, also accounting for negative nodes. Nodes with high expected influence centrality values are considered more central. To enhance accuracy and stability of the network, we examined these values using 1000 bootstraps.

Result

First, we began by exploring the associations between the inclination towards transactional relationships and variables related to childhood-family experiences, mating strategies, and perceived vulnerability towards infections. The maximum number of edges with 8 nodes is 28, but this was reduced to 3 for males and 8 for females using the EBIC glasso estimation. Figure S1 shows the visualization of the network of the variables included in our study split by the biological sex of the participant.

For females, variables seem to form smaller clusters within the network. The three clusters represent childhood and early experiences (HKSS, Family Resources and Unpredictability), Vulnerability (PVD Infectability and Germ Aversion), and mating strategies (ASR, STMO and LTMO). Mating strategies are strongly related to each other with STMO having a strong positive association with ASR, while LTMO has negative associations with both STMO and ASR. This cluster is connected to early experiences throughout HKSS. Family Resources seems to be strongly related to both Family Unpredictability and HKSS. Notably, the vulnerability cluster is not connected to the two other clusters.

In contrast, for males we can only see two clusters. The childhood and early experiences cluster is consistent with that of females. However, the mating strategies cluster only constitutes of two variables: ASR and STMO. The LTMO (long-term mating) variable is not connected to this cluster. Furthermore, the clusters (as well as other variables) appear independent from each other.

Table S1 shows a matrix of the edge weights between all variables included in the network analysis, separately for males and females. Medium strength associations were observed between ASR and STMO (positive), Family Resources and Unpredictability (negative) for both males and females. For females we also found associations between STMO and LTMO (weak negative), ASR and LTMO (weak negative), and HKSS and Family Resources (medium positive).

As shown in Table S2, the two variables (in descending sequence) with the highest strength centrality value were Family Resources for both males and females; followed by HKSS (for males) and STMO (for females). In contrast, PVD variables exhibit the lowest strength centrality value (alongside with LTMO for males). Expected influence analysis reveals that, for both males and females, HKSS and ASR possess the highest values, closely followed by STMO. Conversely, Family Unpredictability and LTMO exhibit the lowest values, and PVD variables demonstrate similarly low expected influence for males.

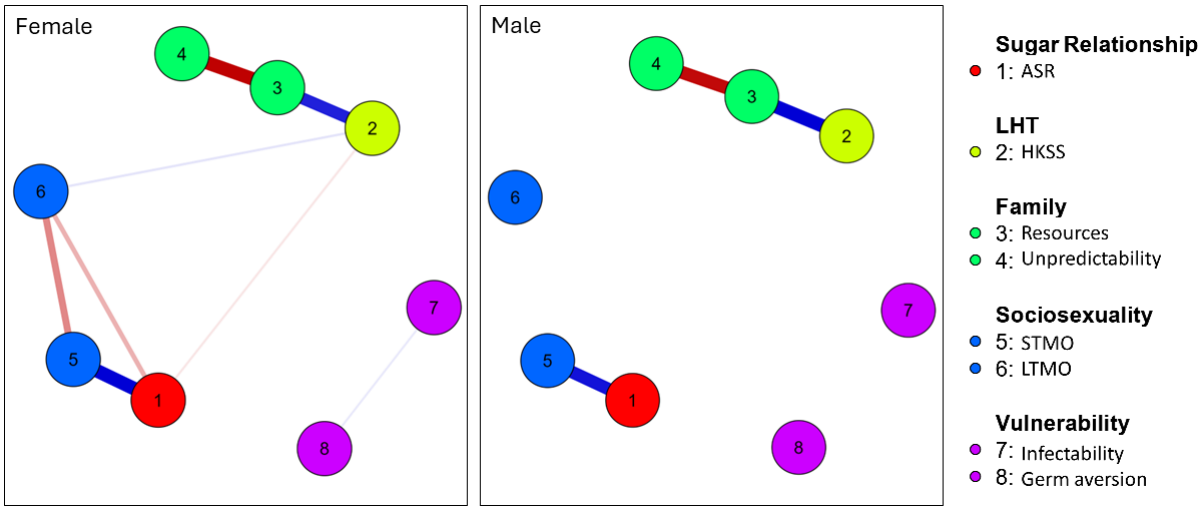


Figure S1 *The visualization of the network of the variables included in our study split by the biological sex of the participant. Blue lines represent positive associations, and red lines negative associations. The thickness of an edge indicates the association strength. Nodes with stronger or more connections are closer together and the most central nodes appear in the center*

Table S1 *Edge weights matrix between the variables from the network analyses*

	Males								Females							
Variable	**1**	**2s**	**3**	**4**	**5**	**6**	**7**	**8**	**1**	**2s**	**3**	**4**	**5**	**l6**	**7**	**8**
1 ASR	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	-0.03	0.00	0.00	0.35	-0.11	0.00	0.00
2 HKSS	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	-0.03	0.00	0.34	0.00	0.00	0.04	0.00	0.00
3 Family resources	0.00	0.22	0.00	-0.21	0.00	0.00	0.00	0.00	0.00	0.31	0.00	-0.35	0.00	0.00	0.00	0.00
4 Family unpredictability	0.00	0.00	-0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.35	0.00	0.00	0.00	0.00	0.00
5 STMO	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.00	-0.17	0.00	0.00
6 LTMO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.11	0.04	0.00	0.00	-0.17	0.00	0.00	0.00
7 PVD Infectability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
8 PVD Germ aversion	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00

Note: ASR = Acceptance of Sugar Relationships in Young Women and Men Scale; HKSS = High-K Strategy Scale; Family Resources = Family Resources Scale; Family Unpredictability = Childhood Unpredictability Scale; STMO = Short-term Mating Orientation; LTMO = Long-term Mating Orientation; PVD Infectability = Perceived Vulnerability to Disease Scale Perceived Infectability; PVD Germ Aversion = Perceived Vulnerability to Disease Scale Germ Aversion

Table S2 *Centrality indices of the variables from the network analyses*

	Males				Females			
Variable	**Be-tween-ness**	**Close-ness**	**Strength**	**Expected influence**	**Between-ness**	**Close-ness**	**Strength**	**Expected influence**
ASR	-0.35	0.00	0.30	1.02	0.54	0.00	0.65	0.86
HKSS	-0.35	0.00	0.40	1.12	1.84	0.00	0.15	1.30
Family Resources	2.48	0.00	1.80	-0.30	0.97	0.00	1.39	-0.27
Family Unpredictability	-0.35	0.00	0.350	-1.79	-0.76	0.00	0.02	-1.64
STMO	-0.35	0.00	0.300	1.02	-0.32	0.00	0.77	0.75
LTMO	-0.35	0.00	-1.05	-0.36	-0.76	0.00	-0.16	-1.12
PVD Infectability	-0.35	0.00	-1.05	-0.36	-0.76	0.00	-1.41	0.05
PVD Germ Aversion	-0.35	0.00	-1.05	-0.36	-0.76	0.00	-1.41	0.05

Note: ASR = Acceptance of Sugar Relationships in Young Women and Men Scale; HKSS = High-K Strategy Scale; Family Resources = Family Resources Scale; Family Unpredictability = Childhood Unpredictability Scale; STMO = Short-term Mating Orientation; LTMO = Long-term Mating Orientation; PVD Infectability = Perceived Vulnerability to Disease Scale Perceived Infectability; PVD Germ Aversion = Perceived Vulnerability to Disease Scale Germ Aversion

Table S3 *All statistical values for the SEM model tested including point estimates (B), standard errors (SE), standardized estimates (ß), z values, and p values.*

				95% Confidence Intervals				
Dependent	**Predictor**	**B**	**SE**	**Lower**	**Upper**	**β**	**z**	**p**
HKSS	Family Resources	0.4756	0.071	0.336	0.6153	0.4770	6.673	< .001
HKSS	Family Unpredictability	-0.0643	0.064	-0.190	0.0618	-0.0645	-0.999	0.318
ASR	HKSS	-0.1714	0.060	-0.289	-0.0536	-0.1709	-2.851	0.004
ASR	STMO	0.5005	0.051	0.402	0.5995	0.5005	9.908	< .001

Note: ASR = Acceptance of Sugar Relationships in Young Women and Men Scale; HKSS = High-K Strategy Scale; Family Resources = Family Resources Scale; Family Unpredictability = Childhood Unpredictability Scale; STMO = Short-term Mating Orientation

4 | FAKING ORGASM IN WOMEN

4.1 Psychometric Evaluation of the Abbreviated Hungarian Faking Orgasm Scale for Women[13]

Edit Csányi[1], Julia Basler[1], Tamás Bereczkei[1], Norbert Meskó[1]*

[1]Institute of Psychology, University of Pécs

*Corresponding author

Abstract

Introduction: The Faking Orgasm Scale for Women (FOS) was developed to explore the motivations behind women's self-reported instances of faking orgasm during oral sex and sexual intercourse. In a recent study, a Hungarian version of the FOS was developed, confirming the same factor structure as the original American version, consisting of four factors across two subscales. ***Methods***: The current study aimed to develop and validate a brief Hungarian FOS. Factor analysis was conducted with data from 2220 women (mean age = 24.4, SD = 7.48 years). The Item Response Theory (IRT) analysis indicated that retaining four-four scales, each comprising of three items was the optimal solution for the revised shorter version. Validation involved 768 women (mean age = 22.6, SD = 4.54 years) completing a questionnaire package, including the Hungarian Short Form of Reasons for Having Sex Questionnaire (YSEX?-HSF) and Women's Sexual Working Models Scale (WSWMS). ***Results***: The results suggest that the Hungarian 24-item FOS, with its four scales within each of the two sub-scales, provides a reliable and valid measurement of motives for faking orgasm in women. The different reasons behind faking orgasm are associated with different sexual working patterns and sexual motivations. Furthermore, women who reported faking orgasms reported significantly higher levels of sexual distancing and perceived lower care from their partners compared to women who reported not faking orgasms. Women who reported faking orgasm were also more likely to engage in sexual activities to attain personal goals and cope with emotional stress. ***Discussion***: The FOS-24 offers both practitioners and researchers a concise and useful instrument for the assessment of faking orgasms.

Keywords: female faking orgasm, sexual working models, sexual motivation, scale abbreviation, relationship sexual dynamics.

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1 Introduction

The peak of sexual arousal, known as orgasm (Masters and Johnson, 1966), is marked by a range of behavioral responses and physiological processes triggered by the release of hormones (Meston et al., 2004). These processes include increased heart rate, respiratory rate, and blood pressure, as well as involuntary muscle contractions in the vagina, uterus, and fallopian tubes (Komisaruk et al., 2006). Additionally, there is a decrease in cortical activity and an increase in activity in the dopamine system, resulting in decreased cognitive functioning and intense pleasure (Georgiadis et al., 2009). Evidence suggests that the female orgasm, while not critical for fertilization (Meston et al., 2004; Wallen and Lloyd, 2008), may occur more frequently around ovulation, potentially increasing the likelihood of conception (Puts et al., 2012). This pattern has been interpreted as consistent with an evolutionary adaptivity hypothesis, although alternative explanations remain plausible. Furthermore, the experience of orgasm encompasses both psychosomatic and psychosexual processes (Mah and Binik, 2002). Weitkamp and Wehrli (2023) compared clitoral and vaginal orgasms, with clitoral orgasms described as more controllable and vaginal orgasms as deeper and more pulsating. This suggests that women's orgasm experiences are diverse, including whole-body, cervical, and mental orgasms.

The orgasm gap refers to the disparity in orgasm frequency between men and women in heterosexual relationships, with women reporting fewer orgasms than their male partners (Frederick et al., 2017). This gap is influenced by several factors, including inadequate sexual education, limited orgasm literacy, and adherence to traditional sexual scripts that prioritize male pleasure. Sexual script theory suggests that cultural norms often shape expectations about sexual behavior, leading to unequal attention to female sexual pleasure (Gagnon and Simon, 1973). One of the major contributors to the orgasm gap is the lack of comprehensive sexual education, which often fails to address female pleasure and anatomy, leaving women less informed about their own bodies and sexual responses (Fine and McClelland, 2006). Similarly, "pleasure literacy"—the ability to understand and communicate one's sexual needs—can be underdeveloped, contributing to the gap (Fahs and Frank, 2014).

Research indicates that men, in addition to seeking their own satisfaction, often express a desire to please their partner (Mark et al., 2014; McKibbin et al., 2010). In the absence of female partner's orgasm (anorgasmia), men tend to evaluate themselves negatively (Salisbury and Fisher, 2014). Consequently, the impact of female orgasm extends beyond individual satisfaction to influence relationship dynamics. Female sexual satisfaction can contribute to maintaining and enhancing emotional bonds and intimacy between partners, increasing overall

satisfaction, and subsequently elevating relationship satisfaction, potentially reducing the likelihood of long-term separation (Welling, 2014).

The variability of orgasmic experiences varies widely (Mah and Binik, 2001; Mangas et al., 2024a) due to individual differences in sensation, subjective evaluation, and the significance attached to one's own orgasm (Hoy et al., 2021; Mangas et al., 2024b), playing a significant role in the lives of some individuals while holding less significance for others (Bancroft, 2008). Furthermore, gender differences are evident: unlike men, for whom satisfaction and physical pleasure are often paramount, women may not necessarily prioritize orgasm during sexual intercourse, viewing it instead as a relational factor (Cormier and O'Sullivan, 2018; Fahs and Plante, 2016; Lentz and Zaikman, 2021; Meskó et al., 2022; Salisbury and Fisher, 2014).

1.1 Faking orgasm

Despite the personal and interpersonal significance, they hold, orgasms are attained less consistently by women compared to men (Wallen, 2006), possibly due to women encountering greater challenges in reaching orgasm (Barnett et al., 2019). During sexual intercourse without direct clitoral stimulation, only about one-third of all women experience an orgasm (Dawood et al., 2005; Prause et al., 2016). Approximately 70% of women report using clitoral stimulation during penetration to enhance sexual pleasure (Hensel et al., 2021). Additionally, only around 32% can reach orgasm while receiving oral sex (Vannier and O'Sullivan, 2012), and 14% of women have never had an orgasm or are unsure if they have (Dunn et al., 1999; Prause et al., 2016).

Despite societal pressure that links orgasm with femininity and normalcy (Ejder Apay et al., 2013; Nicolson and Burr, 2003), which could arise from both internal and various external influences (Chadwick et al., 2019), including magazines, novels, and pornography (Cabrera and Ménard, 2013; Lavie-Ajayi and Joffe, 2009; Séguin et al., 2018), a substantial proportion of women (50–70%) choose to fake orgasms (Csányi et al., 2022; Csányi et al., 2024; Muehlenhard and Shippee, 2010). Faking the climax of sexual activity can be defined as "acting or pretending as if you have had orgasm when you have not, through vocal confirmation and/or muscular contraction, regardless of the reason" (Cooper et al., 2014, p. 426). Female participants in study Bryan's (2001) reported that they fake their orgasms most often during penetration without clitoral stimulation and least often when the intercourse is supplemented by clitoral stimulation.

As orgasm faking is a relational phenomenon, since faking has no meaning without the presence of another person, it is associated with various relational processes such as relationship and sexual satisfaction, love, commitment, and mate retention (Bode et al., 2024; Józefacka et

al., 2023; Mostova et al., 2022). While 90% of men in relationships care if their female partner experiences orgasm (McKibbin et al., 2010), nearly 70% of participating women in study Muehlenhard and Shippee's (2010) reported faking orgasm to avoid hurting their partner's feelings, masculinity, and ego, or to please them.

Frith (2015) suggests that faking orgasm can interpreted as a rational response to gender disparities inherent in heteronormative sexual culture. Within this framework, women are less entitled to sexual pleasure compared to men (Klein and Conley, 2022); their orgasm primarily serves to bolster their partner's masculinity and demonstrate their commitment to them (Lentz and Zaikman, 2021). In Western cultures, particularly through media representations, there is a strong emphasis on being a "good lover" (Dormandy, 2022). For men, this entails satisfying their female partner's needs, while for women, it involves being sexually available and enhancing the masculinity of their male partner by achieving orgasm (Potts, 2000). Consequently, women may resort to faking orgasm to prevent their partners from feeling inadequate.

In contrast, feminist perspectives argue that the unrealistic expectation for women to climax during sexual intercourse (Ejder Apay et al., 2013; Nicolson and Burr, 2003) may lead women to fake orgasm as a means of avoiding stigmatization and being perceived as abnormal (Cooper et al., 2014). Regarding oral sex, the frequency of orgasm is associated with less faking, suggesting that women are more expected to reach orgasm during intercourse than when receiving oral sex (Bryan, 2001).

1.2 Sexual motivation

Sexual motivation can be defined as an individual's intention for engaging in sexual intercourse (Meston and Buss, 2007), and this desire is one of the most fundamental motivational states for both men and women (Regan and Atkins, 2006). Meston and Buss (2007) observed that sexual motivations are more diverse and psychologically complex than previously thought. In contrary to earlier research that identified only a few motivations, they discovered 237 reasons, all capable of influencing participation in sexual intercourse. These reasons span a wide spectrum; for instance, sex might serve as a resource, incentive, reward, punishment, mate-guarding strategy, or as a means to intensify the relationship (Buss, 2003; Buss and Shackelford, 1997; Meskó et al., 2022; Meston and Buss, 2007).

While sexual satisfaction tends to decrease with the length of the relationship (McNulty et al., 2016), sexual motivations also decrease markedly among women (Klusmann, 2002). This decline may be associated with menopause, during which hormonal changes can directly cause sexual dysfunctions and decrease sexual desire. Additionally, hormonal changes may exert

indirect effects through psychological mechanisms such as diminished self-esteem or negative body image due to weight gain and depression (Genazzani et al., 2007).

Research on sexual motivations has also revealed gender differences in attitudes toward sex and sexual behaviors (Meston and Buss, 2007). Generally, women's sexual motivation tends to be more emotional, while men are more motivated by purely physical reasons to engage in sexual activities that may not require a deep understanding of the partner (Basson, 2000). Men tend to masturbate, consume pornographic content, and have sexual thoughts more frequently than women (Petersen and Hyde, 2010). Meskó et al. (2022) highlighted gender-specific patterns in sexual motivations, noting that men are driven by personal goals, leading them to be more impulsive and seek novelty, potentially resulting in infidelity more often.

In contrast, women's sexual motivation is more characterized by coping with emotional difficulties, such as fear of abandonment, which may be interpreted as a form of subordination (Barbaro et al., 2015). Women are more likely to engage in sexual intercourse because they believe it will help maintain their partner, increase commitment to the relationship, and provide emotional closeness, bonding, and feelings of love (Impett et al., 2005).

Lehmiller (2023) suggests that sexual attitudes and behaviors are influenced not only by biological determinism but also by psychosocial factors, including societal expectations to conform to norms. Additionally, social pressures can also manifest in the perception of sexual availability as a commodity that can be exchanged for goods or resources (Meskó et al., 2022).

The Hungarian Short Form of Reasons for Having Sex Questionnaire (YSEX?-HSF; Meskó et al., 2022) was chosen for validating the Faking Orgasm Scale because it effectively captures a wide range of sexual motivations, including those focused on coping strategies. This focus on coping-driven sexual motivation is particularly relevant, as it likely relates to the reasons women may fake orgasms, providing deeper insight into the psychological factors influencing this behavior.

1.3 Women's sexual working models

Although sexuality is typically understood within a relational framework, it is essential to consider not only general characteristics but also individual differences that influence the psychological functioning of the sexual system including associated motivations, emotions, and cognition when examining sexual activities (Birnbaum et al., 2014; Meskó and Õry, 2023). Birnbaum et al. (2014) developed a multidimensional assessment to evaluate experiences of heterosexual intercourse in women, providing a multifaceted emotional, cognitive, and motivational profile of women's sexuality. These models of sexual functioning reveal individual patterns of attitudes, responses and behaviors within women's sexual activities, helping to define

the role of sexuality in women's lives and enhancing comprehension of the complexities of female sexual behavior (Birnbaum et al., 2001). Additionally, they may unveil dyadic relationship dynamics, such as the connection between sexual activity and relationship satisfaction (Hassebrauck and Aron, 2001).

However, sexual functioning can also involve contradictory elements, as highlighted by Birnbaum and Reis (2006), where a woman may experience negative emotions during sexual activities despite believing in the importance of sex in maintaining her relationship. Women with such ambivalent sexual experiences may behave differently from those who have not encountered such experiences (Birnbaum, 2003). Therefore, to fully comprehend the intricate functioning of sexuality, models of sexual functioning must encompass various positive and negative emotions, affective responses to the sexual cycle, as well as thoughts and goals related to the self, the partner, the dyadic relationship, and the sexual act (Birnbaum et al., 2016).

The Women's Sexual Working Models Scale (WSWMS; Birnbaum et al., 2014) was chosen for validating the Faking Orgasm Scale for Women (FOS) because it provides a comprehensive assessment of women's internalized beliefs and expectations about sexual relationships. Its relevance lies in its ability to capture the psychological and relational dynamics that influence sexual behavior, making it a valuable tool for understanding the underlying motivations and attitudes that may drive behaviors like faking orgasms.

Over the last decade, there has been relatively limited research employing the original Faking Orgasm Scale for Women (Cooper et al., 2014), probably due to its extensive length (56 items). Compared to longer scales, concise questionnaires may be preferable for several reasons. Although longer scales can offer more extensive data, they also tend to induce respondent fatigue, increase response error rates, and reduce completion rates (Rolstad et al., 2011; Saucier, 1994). Furthermore, it is believed that shortening scales may have less impact on psychometric quality due to the reduction of redundancy. As a result, more condensed self-report instruments may exhibit even stronger validity indices (Burisch, 1997). Therefore, the development of short and multidimensional questionnaires with high psychometric properties benefits both researchers and participants (Jonason and Webster, 2010).

2 Research aim

The aim of the present study was twofold. First, we sought to reduce the number of items in the Hungarian version of the Faking Orgasm Scale for Women (FOS; Csányi et al., 2024) to develop a shorter instrument while maintaining the ability to assess the four major dimensions of orgasm faking during oral sex and sexual intercourse, as captured by the original version.

The secondary aim was to analyze the criterion validity of the FOS-24 to ensure the psychometric quality of the shorter scale and create a more concise measure of orgasm faking among women for studies requiring data on the fundamental patterns of faking orgasm. Additionally, we evaluated whether there is a correlation in motivation behind orgasm faking with questionnaires on sexual working models and motivation for participating in sexual activities, which are key factors in sexuality. We anticipated that the newly developed instrument would exhibit similar correlations with sexual motivations (YSEX?-HSF; Meskó et al., 2022) and the Women's Sexual Working Models Scale (WSWMS; Birnbaum et al., 2014) as observed by Csányi et al. (2024).

3 Materials and methods

3.1 Participants and procedure

Data from Csányi et al. (2024) were utilized for the abbreviation and validation procedure of the FOS-24.

Sample 1

The factor analysis was conducted using responses from a sample of 2,220 individuals, all identifying their birth sex as female and current gender identity as woman. The average age of the sample was 24.40 years (SD = 7.48, min = 18 years, max = 80 years). Of these participants, 1,726 (77.7%) reported being in some form of relationship at the time of the study; 849 were in a relationship, 677 were in a cohabitation relationship with a partner, and 200 stated that they were married. Among the respondents, 752 (33.9%) reported faking orgasm during receiving oral sex, while 1,051 (47.3%) reported faking orgasm during sexual intercourse at least once in their life. Specifically, 155 participants reported faking orgasm only during receiving oral sex, 454 reported faking orgasm only during sexual intercourse, and 597 reported faking it in both situations.

Sample 2

A total of 768 women completed the questionnaire package used for validation. In addition to demographic questions, they completed three questionnaires investigating faking orgasm in two scenarios, psychological motives associated with women's sexual working models, and motivations behind engaging in sexual intercourse. The age of participants ranged from 18 to 48 years (M = 22.6 years, SD = 4.54). Of these participants, 552 (71.9%) were in some form of relationship (dating, cohabitation, marriage). Among respondents, 278 (36.2%) reported faking orgasm while receiving oral sex, and 369 (52%) reported faking orgasm during sexual intercourse at least once in their life. 53 participants reported faking orgasm during oral sex only,

144 during sexual intercourse only, and 225 reported faking it in both situations. Information on sexual orientation was not collected in this survey. Therefore, it can be assumed that, as in previous Western surveys (e.g., Bailey et al., 2016; Ganna et al., 2019), predominantly same-sex attracted respondents make up less than 5% of the respondents in this sample.

All respondents filled out the questionnaires online, using Qualtrics. The link to the survey was disseminated via social media sites (e.g., Facebook, Instagram) and university mailing lists. Our goal was to obtain a heterogeneous sample and so we intentionally ensured that the survey was accessible to various segments of the population. All participants gave informed consent, and none of them were rewarded for participation. The studies received ethical approval from the Hungarian United Ethical Review Committee for Research in Psychology (Ref. No. 2017/21, 2022/107). The studies were not preregistered. A priori sample size calculation was not performed. All source data are available at: https://osf.io/96emq/?view_only=8eca7faedc0d4f67848c029eac2a0070.

3.2 Measures

As one questionnaire was not yet available in Hungarian the authors initially translated the items and instructions of the Women's Sexual Working Models (WSWMS; Birnbaum et al., 2014) into Hungarian. The resulting Hungarian version underwent verification using the standard back-translation technique (Brislin, 1980). This involved retranslating the items and instructions back into English by an independent translator not associated with the study. Any discrepancies that arose during the back-translation process were resolved by the two translators. Following the validation process established by Csányi et al. (2024) for the 56-item version of the Hungarian FOS, we utilized the same measures, including the Short Form of Reasons for Having Sex Questionnaire (YSEX-HSF; Meskó et al., 2022) and Women's Sexual Working Models (WSWMS; Birnbaum et al., 2014). This approach aimed to improve comparability between the newly developed shorter version and the longer version of FOS.

3.2.1 Faking Orgasm Scale for Women, Hungarian form (FOS)

The FOS [Cooper et al., 2014; Hungarian version developed by Csányi et al. (2024)] is a comprehensive 56-item self-report tool designed to explore women's motivations for faking orgasm during sexual intercourse (33 items; sexual intercourse subscale) and while receiving oral sex (23 items; oral sex subscale). Participants provided responses to open-ended questions and indicated their level of agreement with each item on a 5-point scale ranging from Never to Always. Only participants who reported faking orgasm during sexual intercourse completed the Sexual Intercourse subscale. This subscale encompasses four dimensions: Altruistic Deceit (SIAD), which assesses the respondent's concern for their partner's feelings as a motivation for

faking orgasm (e.g., “To make your partner happy”); Fear and Insecurity (SIFI), which measures whether women fake orgasm to avoid negative emotions (e.g., “Because you are ashamed you cannot reach orgasm”); Elevated Arousal (SIEA), which evaluates women’s tendency to use faked orgasm to heighten their arousal during sexual intercourse (e.g., “To turn yourself on”); and Sexual Adjournment (SISA), referring to faking orgasm as a means to quickly end sexual intercourse (e.g., “Because you simply are not enjoying yourself”). Likewise, only participants who reported faking orgasm during oral sex completed the Oral Sex subscale. This subscale also had four dimensions: Altruistic Deceit (OSAD), Insecure Avoidance (OSIA), Elevated Arousal (OSEA), and Fear of Dysfunction (OSFD). These dimensions assess various motivations for faking orgasm during oral sex, including concern for the partner’s feelings, avoidance of negative emotions, arousal enhancement, and fear related to sexual health or inadequate response. Internal reliability indicators of the questionnaire are presented in Table 1.

3.2.2 Women’s Sexual Working Models Scale (WSWMS)

The WSWMS developed by Birnbaum and Reis (2006), is a self-report instrument designed to assess various dimensions of feelings, expectations, and beliefs regarding sexual activity. It provides a reliable measure of cognitive, behavioral, and affective aspects of individuals’ sexual lives within romantic relationships. This scale outlines five key dimensions of sexual behavior that contribute uniquely to understanding sexuality in women’s romantic relationships. (1) The Guilt and Shame factor relates to negative sexual self-perception and anxiety, and it is inversely correlated with sexual satisfaction (e.g., “Engaging in sexual activity makes me feel guilty”). (2) Maintain the Bond reflects the belief that sexual interactions foster intimacy between partners and strengthens their emotional connection (e.g., “Sexual activity serves to deepen the bond between two individuals”). (3) Distancing/Distraction signifies feelings of detachment from the sexual experience and one’s partner due to intrusive thoughts (e.g., “During sexual activity my mind is often preoccupied with distracting thoughts”). (4) Caring Partner assesses the perception of a sexual partner as attentive and responsive to one’s needs during sexual encounters (e.g., “My partner demonstrates care and consideration for me during sexual activity”). (5) Excitement represents intense sexual desire, a powerful motivator of human behavior (e.g., “During sexual activity, I experience a strong sense of excitement”). Participants rated each statement on a 5-point scale (1 = Somewhat characteristic, 5 = Very characteristic) based on its relevance to their experiences. Internal reliability indicators for the questionnaire are detailed in Table 1.

Table 1 *The internal reliability indicators of the questionnaires*

Measures	Subscales	McDonald' ω
Faking Orgasm Scale for Women, Hungarian brief form (FOS-24)		
Oral Sex		.788
	Altruistic Deceit	.901
	Insecure Avoidance	.808
	Elevated Arousal	.821
	Fear of Dysfunction	.800
Sexual Intercourse		.757
	Altruistic Deceit	.851
	Fear and Insecurity	.845
	Elevated Arousal	.909
	Sexual Adjournment	.749
Women's Sexual Working Models Scale (WSWMS)		
	Guilt and Shame	.903
	Maintain the Bond	.883
	Distancing/Distraction	.889
	Caring Partner	.894
	Excitement	.826
Reasons for Having Sex Questionnaire Hungarian Short Form (YSEX?-HSF)		
	Personal Goal Attainment	.897
	Relational Reasons	.923
	Sex As Coping	.902

3.2.3 Reasons for having sex questionnaire, Hungarian form (YSEX?-HSF)

The YSEX?-HSF (Meskó et al., 2022) is a self-report instrument which includes three subscales for measuring sexual motivation. Based on the original American YSEX? questionnaire (Meston and Buss, 2007), Meskó et al. (2022) created the Hungarian version of the YSEX? questionnaire, which included three factors instead of the original four-factor structure. The YSEX?-HSF is comprised of three subscales with 73 items. The Personal Goal Attainment subscale includes reasons that lead an individual to engage in sexual intercourse to achieve personal sexual interests (e.g., "I wanted to seek experience"). The Relational Reasons subscale refers to reasons that lead an individual to have sexual intercourse because some aspect of the partner relationship is important (e.g., "I wanted to celebrate"). The Sex as Coping subscale refers to reasons that lead an individual to have sexual intercourse as a way of coping with internal (personal) or external (relational) conflicts (e.g., "I wanted to retain the relationship"). Participants were requested to indicate how frequently each of the listed reasons led them to have sexual intercourse in the past. If someone had not yet had sex, they were asked to use the scale to indicate what the likelihood that each of the listed reasons would lead them to have sex. Each item was rated on a 5-point scale: "None of my sexual experiences" (1), "A few of my

sexual experiences" (2), "Some of my sexual experiences" (3), "Many of my sexual experiences" (3), "All of my sexual experiences" (5). Higher scores indicate higher sexual motivation. The internal reliability indicators of the questionnaire are presented in Table 1.

3.3 Statistical analyses

We used a confirmatory factor analysis (CFA) first to confirm the unidimensionality of the latent variables, as that is a requirement of item response theory (IRT). We used the diagonally weighted least squares (DWLS) estimator. To evaluate model fit, we used the comparative fit index (CFI), Tucker-Lewis index (TLI), the root mean square error of approximation (RMSEA), and the standardized root mean squared residual index (SRMR). Cutoff values indicative of good model fit were CFI and TLI values of 0.95 or greater (Hu and Bentler, 1998; Babyak and Green, 2010), and RMSEA and SRMR values of 0.06 or lower (Babyak and Green, 2010).

In our analysis of the psychometric properties of each item, we employed the graded response model (GRM) developed by Samejima (1968). The GRM is particularly suited for ordinal variables such as Likert-type scales, as it accounts for varying levels of agreement across response categories. This model allows items to relate differently to a latent trait (i.e., the different dimensions of faking orgasms). Our focus was on discrimination parameter (a), which shows the slope of the scale at a given item location; a steeper slope indicates a better discrimination property of the item (Baker, 2001). A higher a value indicates that the item is more effective at distinguishing between individuals with similar levels of the latent trait. We retained the best items among the ones with very high discrimination ability ($a > 1.7$; Baker, 2001), as these items allow to discriminate between individuals precisely even in an abbreviated scale.

Next, we calculated McDonald's ω coefficients to check the internal consistency of each questionnaire we used. We chose the McDonald's omega over Cronbach's alpha because it allows a more accurate measure of internal consistency when the assumptions of the tau-equivalent model (i.e., violation of the equal-item variance) are not met (Dunn et al., 2014).

To evaluate the psychometric properties of the FOS-24, a confirmatory factor analysis (CFA) was performed for the two scales separately. The same model fit indicators as above described were used. The external validity of the FOS-24 was tested with Spearman's coefficients to examine the correlations between each subscale of the two scales and each subscale of the WSWMS, YSEX?-HSF and the original version of the Hungarian FOS. Due to violations of normal distribution, Spearman correlations were used. The Benjamini-Hochberg false discovery rate (FDR) procedure was applied to correct for multiple testing (Benjamini and Hochberg, 1995; Verhoeven et al., 2005) with p-values accepted at an FDR-corrected threshold

of $q < 0.05$. This method offers a more balanced approach as opposed to traditional and conservative methods (like the Bonferroni correction) and controls the proportion of false positives among significant results. The Benjamini-Hochberg corrected p-values were calculated using the spreadsheet available at http://www.biostathandbook.com/benjaminihochberg.xls. In our manuscript we report the p-values that remained significant after correction.

Differences between faking and non-faking women were analyzed using Mann-Whitney U tests, as the variables were not normally distributed.

4 Results

4.1 Item response analysis

Confirmatory factor analyses were run to confirm unidimensionality. For both scales, the results indicated that the four-four factor model provided an acceptable fit (Oral subscale: CFI = 0.985, TLI = 0983, RMSEA = 0.084 [90% CI: 0.079–0.089], SRMR = 0.096; Intercourse subscale: CFI = 0.983, TLI = 0.982, RMSEA = 0.081 [90% CI: 0.079–0.084], SRMR = 0.091). As the CFAs confirmed that all scales had a single latent variable, the FOS-24 was analyzed using GRM IRT.

First, we examined the Oral subscales. For Altruistic Deceit subscale, eight out of nine items (6, 7, 8, 9, 10, 11, 12, 13) on the scale met the a priori threshold (1.7) for the parameter a. We decided to retain the three items with the highest parameter a value, items 7, 8, and 9, respectively. On the Insecure Avoidance subscale, three out of four items (1, 2, 4) met the threshold of 1.7, so we retained all three items. On the Elevated Arousal subscale, three out of five items (16, 17, 18) met the threshold, all of which we retained. On the Fear of Dysfunction subscale, three out of four items (15, 21, 22) met the necessary a value, so we retained them all. Thus, the shortened Oral subscales consist of 12 items, three for each subscale.

Next, the Intercourse subscales was analyzed. For Altruistic Deceit, 11 out of 14 items (1, 2, 3, 4, 5, 8, 9, 11, 12, 14, 16) met the a priori threshold of 1.7 for parameter a, and we decided to retain the three items with the highest a value (items 3, 4, and 9). For the Fear and Insecurity subscale, eight out of ten items (7, 21, 22, 23, 24, 25, 26, 27) reached the threshold, of which we selected the three with the highest values (7, 22, 25). On the Elevated Arousal subscale, five out of seven items (29, 30, 32, 33, 34) had a parameter a value higher than 1.7, of which the retained items (32, 33, 34) had the highest. Finally, on the Sexual Adjournment subscale, all three items (15, 17, 19) reached the necessary threshold and were retained for the short version of the questionnaire. Thus, the shortened Intercourse subscales consist of 12 items, three for each subscale.

Details of parameter a values for all items are provided in Supplementary Table 1. The Supplementary Materials also include the final version of the FOS-24 with a short scoring guide in Hungarian.

Table 2 *Spearman correlation between 24-item and 56-item versions of Hungarian Faking Orgasm Scale for Women*

FOS scales	Spearman *r*
Oral Sex subscales	
Altruistic Deceit (OSAD)	.915 ***
Insecure Avoidance (OSIA)	.934 ***
Elevated Arousal (OSEA)	.977 ***
Fear of Dysfunction (OSFD	.989 ***
Sexual Intercourse subscales	
Altruistic Deceit (SIAD)	.898 ***
Fear and Insecurity (SIFI)	.922 ***
Elevated Arousal (SIEA)	.982 ***
Sexual Adjournment (SISA)	1.000 ***

Note: *** $p < .001$

4.2 Properties of the abbreviated scales

To assess the psychometric properties of the FOS-24, we conducted confirmatory factor analysis (CFA) for each scale separately. For both scales, the results indicated that the four-four factor model provided an acceptable fit (Oral subscale: CFI = 0.991, TLI = 0.988, RMSEA = 0.029 [90% CI: 0.016–0.040], SRMR = 0.039; Intercourse subscale: CFI = 0.984, TLI = 0.978, RMSEA = 0.038 [90% CI: 0.0296–0.046], SRMR = 0.04; Factor loadings are provided in Supplementary Table 2).

Based on the McDonald's omega, both scales of the brief version showed adequate internal consistency, similar to the other used questionnaires (WSWMS, YSEX?-HSF; for further details, refer to Table 1). The values for the shortened version were comparable to those of the original scales.

4.3 External validity of the abbreviated scales

The external validity was analyzed by calculating the correlations between each subscale of the two main scales of FOS-24 with the original version of the Hungarian FOS (see Table 2), as well as each subscale of the WSWMS (Table 3) and YSEX?-HSF (Table 4). The results

Table 3 *Spearman correlation between reasons for faking orgasm (FOS-24, FOS-56) and sexual working models (WSWMS)*

Women's Sexual Working Models Scale (WSWMS)	*Hungarian Brief version of Faking Orgasm Scale for Women (FOS-24)*				*56-item version of the Hungarian Faking Orgasm Scale for Women (FOS; Csányi et al., 2024)*			
	Oral Sex subscales							
	OSAD	*OSIA*	*OSEA*	*OSFD*	*OSAD*	*OSIA*	*OSEA*	*OSFD*
Guilt and Shame	.079	.211 ***	.085	.158 **	.089	.232***	.117	.170**
Maintain the Bond	.106	.003	.192 **	.050	.135*	.040	.187**	.039
Distancing	.176 **	.268 ***	.050	.327 ***	.188**	.297***	.057	.341***
Caring Partner	-.044	-.060	.042	-.164 **	-.037	-.059	.014	-.171**
Excitement	-.103	-.199 ***	.247 ***	-.121 *	-.051	-.189**	.239***	-.132*
	Sexual Intercourse subscales							
	SIAD	*SIFI*	*SIEA*	*SISA*	*SIAD*	*SIFI*	*SIEA*	*SISA*
Guilt and Shame	.060	.134 **	.104 *	.206 ***	.081	.212***	.092	.206***
Maintain the Bond	.179 ***	.019	.155 **	-.087	.179***	.022	.137**	-.087
Distancing	.150 **	.319 ***	.070	.385 ***	.208***	.353***	.069	.385***
Caring Partner	-.068	-.166 **	-.035	-.268 ***	-.093	-.198***	-.035	-.268***
Excitement	-.04	-.098	.159 **	-.187 ***	-.009	-.111*	.175***	-.187***

Note: * $p < .05$; ** $p < .01$; *** $p < .001$; Oral Sex subscales: Altruistic Deceit (OSAD); Insecure Avoidance (OSIA); Elevated Arousal (OSEA); Fear of Dysfunction (OSFD); Sexual Intercourse subscales: Altruistic Deceit (SIAD); Fear and Insecurity (SIFI); Elevated Arousal (SIEA); Sexual Adjournment (SISA); WSWMS = Women's Sexual Working Models Scale

Table 4 *Spearman correlation between reasons for faking orgasm (FOS-24, FOS-56) and sexual motivations (YSEX?-HSF)*

Reasons for Having Sex Questionnaire, Hungarian form (YSEX-HSF)	*Hungarian Brief version Faking Orgasm Scale for Women (FOS-24)*				*56-item version of the Hungarian Faking Orgasm Scale for Women (FOS; Csányi et al., 2024)*			
	Oral Sex subscales							
	OSAD	*OSIA*	*OSEA*	*OSFD*	*OSAD*	*OSIA*	*OSEA*	*OSFD*
Personal Goal Attainment	.080	.037	.192 **	.123 *	.108	.044	.206***	.120*
Seeking novelty	.056	-.033	.078	.074	.048	-.053	.083	.070
Conformity	.026	.128 *	.012	.062	.052	.137*	.006	.067
Infidelity	-.010	-.068	.012	-.009	-.038	-.074	.021	-.010
Impulsiveness	-.050	.069	.155 **	.150 *	-.027	.073	.187**	.144*
Revenge	.004	.016	.034	-.009	.024	.055	.051	-.001
Seeking sensation	.087	-.091	.098	-.015	.082	-.086	.108	-.019
Control and power	.122 *	.039	.115	-.017	.108	.038	.131*	-.027
Boosting self-esteem	.115	.151 *	.235 ***	.239 ***	.169**	.175**	.245***	.245***
Relational Reasons	.093	-.023	.158 **	.043	.123*	.023	.158**	.038
Sexual desire	.058	-.053	.072	-.004	.061	-.046	.066	-.014
Commitment	.093	.008	.095	.038	.129*	.044	.089	.041
Physical attraction	.128 *	-.041	.049	.013	.103	-.014	.050	.009

Reasons for Having Sex Questionnaire	Faking Orgasm Scale for Women, Hungarian brief form (FOS-24)				Faking Orgasm Scale for Women, original version (FOS)			
	Sexual Intercourse subscales							
	SIAD	*SIFI*	*SIEA*	*SISA*	*SIAD*	*SIFI*	*SIEA*	*SISA*
Relaxation	.045	-.068	.164 **	.061	.060	-.021	.194**	.056
Intimacy	.053	.039	.123 *	-.023	.073	.065	.102	-.020
Excitement	.050	-.136 *	.046	-.045	.040	-.126*	.063	-.051
Self-affirmation	.058	.030	.152 *	.039	.101	.056	.151*	.031
Care	.030	-.016	.063	.101	.068	.026	.059	.098
Happiness seeking	.048	.065	.170 **	.138 *	.119*	.100	.153*	.133*
Sex As Coping	.161 **	.114	.228 ***	.197 ***	.173**	.141*	.236***	.196***
Mitigating emotional deficit	.125 *	.114	.217 ***	.150 *	.145*	.156**	.237***	.157**
Compulsion and avoidance	.189 **	.123 *	.137 *	.188 **	.146*	.155**	.125*	.194**
Utilitarianism	-.009	.003	.129 *	.002	.022	-.020	.144*	-.007
Coping with relational conflicts	-.057	.079	.130 *	.107	-.066	.057	.125*	.099
Submissiveness	.154 *	.175 **	.216 ***	.194 **	.205***	.194**	.239***	.191**
Coping with partner's emotional demands	.137 *	-.044	.007	-.058	.101	-.016	.023	-.061
Mate retention	.178 **	.091	.109	.163 **	.173**	.111	.117	.162**

Personal Goal Attainment	.116 *	.070	.186 ***	.223 ***	.155*	.124*	.185***	.223***
Seeking novelty	.055	.075	.116 *	.143 **	.090	.094	.122*	.143**
Conformity	.105 *	.090	.003	.152 **	.105*	.103*	.021	.152**
Infidelity	-.017	-.088	.089	.156 **	.004	-.026	.076	.156**
Impulsiveness	.020	.054	.145 **	.109 *	.036	.063	.144**	.109*
Revenge	.019	-.036	.109 *	.120 *	.065	.019	.114*	.120*
Seeking sensation	.083	-.064	.079	.185 ***	.061	-.024	.064	.185***
Control and power	.029	-.014	.105 *	.022	.071	.021	.112*	.022
Boosting self-esteem	.166 **	.220 ***	.258 ***	.175 ***	.232***	.273***	.258***	.175***
Relational Reasons	.193 ***	.143 **	.259 ***	.030	.225***	.162**	.262***	.030
Sexual desire	.126 *	-.012	.043	-.017	.124*	-.019	.038	-.017
Commitment	.156 **	.125 *	.169 **	-.014	.179***	.144**	.165**	-.014
Physical attraction	.126 *	.060	.135 **	.035	.106*	.078	.149**	.035
Relaxation	.075	.031	.170 **	.135 **	.088	.067	.180***	.135**
Intimacy	.100	.058	.070	-.107 *	.081	.023	.076	-.107*
Excitement	.101	.057	.169 **	-.008	.111*	.070	.166**	-.008
Self-affirmation	.157 **	.169 **	.303 ***	.000	.240***	.175***	.303***	.000

Care	.185 ***	.175 ***	.204 ***	.106 *	.227***	.201***	.205***	.106*
Happiness seeking	.188 ***	.193 ***	.249 ***	-.014	.228***	.215***	.242***	-.014
Sex As Coping	.203 ***	.222 ***	.252 ***	.351 ***	.253***	.302***	.255***	.351***
Mitigating emotional deficit	.134 **	.220 ***	.211 ***	.261 ***	.203***	.278***	.219***	.261***
Compulsion and avoidance	.149 **	.122 *	.106 *	.422 ***	.155**	.148**	.099	.422***
Utilitarianism	.012	-.030	.157 **	.076	.024	.018	.137**	.076
Coping with relational conflicts	.050	.081	.141 **	.125 *	.079	.131*	.147**	.125*
Submissiveness	.181 ***	.231 ***	.211 ***	.250 ***	.238***	.298***	.214***	.250***
Coping with partner's emotional demands	.143 **	.067	.059	.272 ***	.159**	.074	.074	.272***
Mate retention	.203 ***	.190 ***	.192 ***	.291 ***	.225***	.269***	.185 ***	.291 ***

Note: * $p < .05$; ** $p < .01$; *** $p < .001$; Oral Sex subscales: Altruistic Deceit (OSAD); Insecure Avoidance (OSIA); Elevated Arousal (OSEA); Fear of Dysfunction (OSFD); Sexual Intercourse subscales: Altruistic Deceit (SIAD); Fear and Insecurity (SIFI); Elevated Arousal (SIEA); Sexual Adjournment (SISA); YSEX?-HSF = Hungarian Short Form of Reasons for Having Sex Questionnaire

indicate that the correlations of FOS and FOS-24 were highly similar with the sexual working models and sexual motivations.

4.4 Comparison between women who reported faking orgasm and women who did not

Using Mann-Whitney tests, we investigated whether there are differences in sexual functioning models (see Figure 1) and sexual motivations (see Figure 2) between women who reported faking orgasm and those who did not, both when receiving oral sex and during sexual intercourse. Among the different sexual functioning models, there is a significant difference in the Distancing and Caring Partner dimensions both during receiving oral sex and sexual intercourse (See the results of the Mann Whitney U test and the average scores of the factors in Supplementary Table 3) The differences in the mean scores suggest that women who fake orgasm are more inclined to maintain distance in sexual situations due to experienced indifference and detachment from the sexual event and the partner. Moreover, they perceive their sexual partners as caring for their needs to a lesser extent. This factor can predict both sexual and relational satisfaction (Birnbaum and Reis, 2006), indicating that those who do not perceive their partner's care are less likely to experience satisfaction and may resort to faking orgasm.

5 Discussion

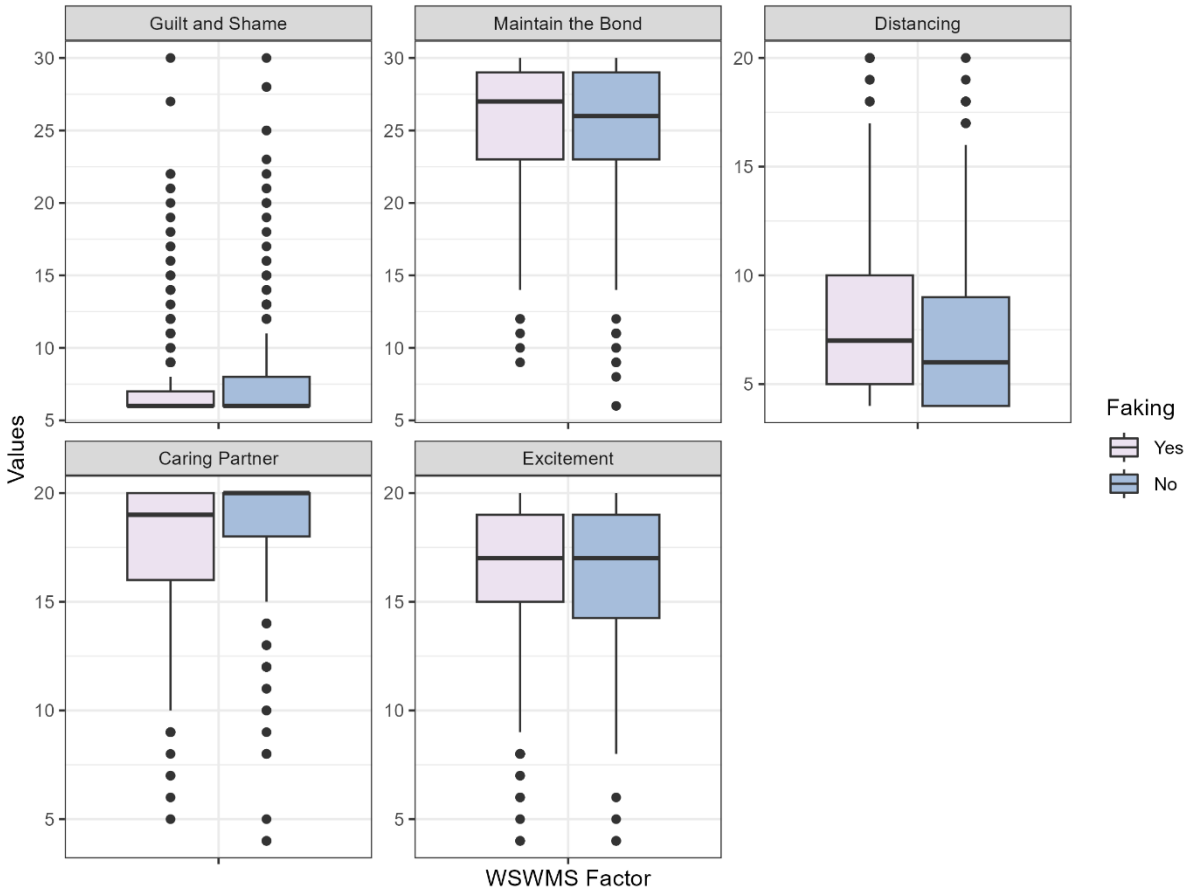
5.1 Development of the brief version

The primary aim of the study was to develop a shortened form of the Hungarian version of the Faking Orgasm Scale for Women (FOS) (Csányi et al., 2024). We employed Item Response Theory (IRT) to identify items with optimal discrimination parameters. Crucially, this abbreviated Hungarian version of the FOS retains the informational integrity of the original questionnaire concerning its four factors across both scales (Sexual Intercourse and Oral Sex). The final three-item short forms of the Hungarian FOS-24 subscales exhibited excellent reliability and internal consistency. Significantly, all subscales exhibited a positive shift on the latent trait, indicative of the instrument's validity and effectiveness in examining potential motives across diverse samples. In summary, the FOS-24 demonstrates robust psychometric properties, offering valid and reliable assessments of the twice-four motivations for faking orgasm while accommodating individual differences within our Hungarian sample.

5.2 External validity assessment

The secondary aim of the present study was to evaluate the external validity of the FOS-24 using self-report measures of motivations and models of sexuality.

Figure 1 *Sexual working models of women who reported having ever faked an orgasm compared to women who reported having never faked an orgasm (N = 768)*



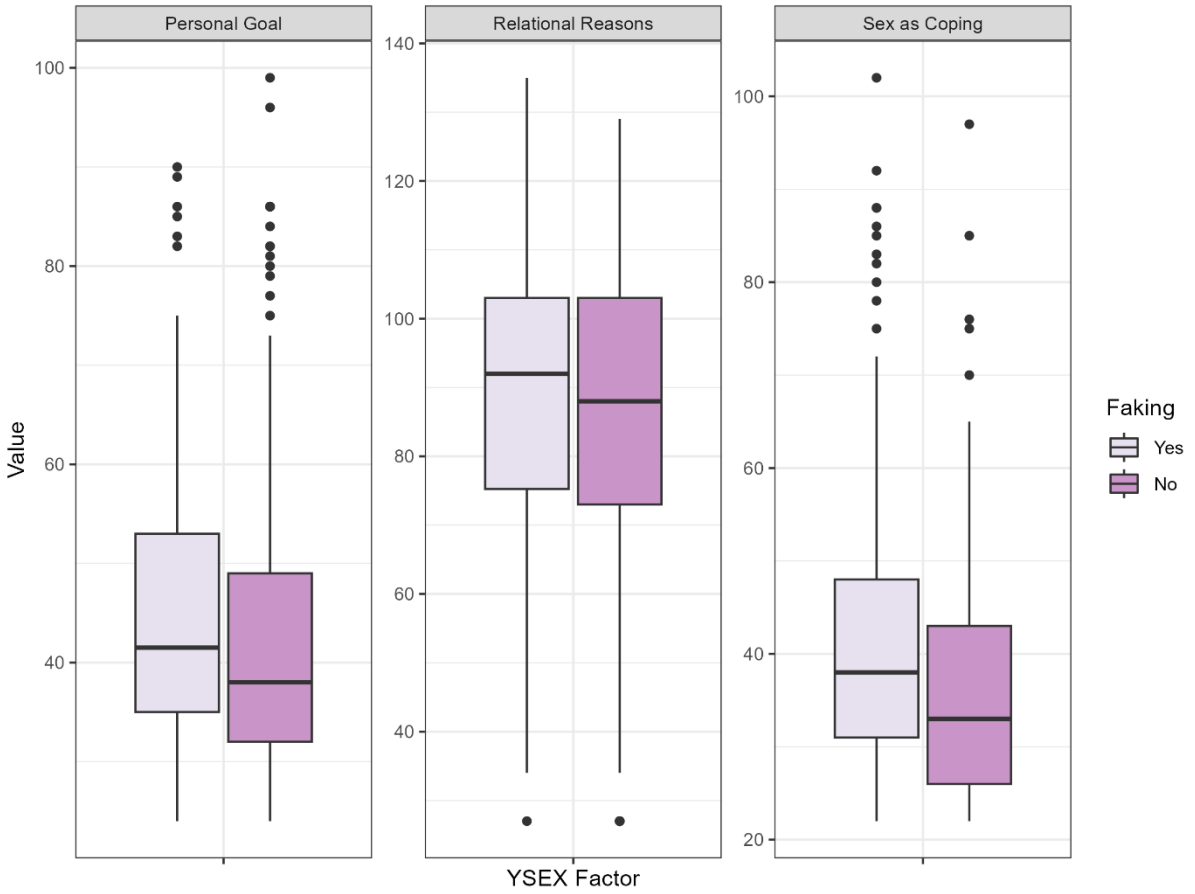
Note: WSWMS = Women's Sexual Working Models Scale

5.2.1 Women's sexual working models scale

Consistent with the findings of the 56-item version of the FOS (Csányi et al., 2024), the strongest associations with faking orgasm were found with the Distancing factor of the Women's Sexual Working Models Scale (Birnbaum and Reis, 2006) in both sexual situations examined (during sexual intercourse and receiving oral sex). This suggests that orgasm faking, driven by negative emotions such as fear, uncertainty, and sexual postponement, leads to emotional indifference toward the partner and the sexual encounter, significantly contributing to a decreased relationship satisfaction among women who reported faking orgasm (Csányi et al., 2022). The strongest correlation is observed with orgasm faking for the purpose of Sexual Adjournment, which may serve two functions. It allows the individual to shorten the duration of unpleasant sexual activity, while also avoiding relationship tensions that might result from directly rejecting the partner's sexual advances (Thomas et al., 2017). Thus, overall, it can be viewed as a defense mechanism (Frith, 2018), contributing to increased relational and sexual detachment.

Perceiving the partner as caring and sensitive to one's needs showed a significant, moderately strong negative correlation only with orgasm faking for the purpose of delaying sexual intercourse. This finding is consistent with Frith's (2018) explanation, which suggests that due to a partner's emotional distance, lack of sympathy, and limited potential for honest communication, faking orgasm becomes one of the least risky ways to terminate sexual activity.

Figure 2 *Sexual motivation of women who reported having ever faked an orgasm compared to women who reported having never faked an orgasm (N = 768)*



Note: YSEX = Reasons for Having Sex Questionnaire

During receiving oral sex, behaviors associated with negative self-schema and sexual anxiety showed positive associations with faking orgasm as a means of avoiding one's own negative emotions. These behaviors often stem from feelings of shame and guilt arising from conflicts with body image and genital self-image (Hoy et al., 2021). The exposure of the vulva (external genitalia) during oral sex may exacerbate anxiety and shame related to dissatisfaction with them (Fahs, 2014), thus prompting individuals to fake orgasm.

Media influence may contribute to the association between faking and feelings of shame during sexual intercourse, as it frequently portrays reaching orgasm as the primary indicator of

sexual satisfaction (Lavie-Ajayi and Joffe, 2009). Sociocultural norms also exert pressure, suggesting that experiencing orgasm is essential for feeling normal and feminine (Nicolson and Burr, 2003), thereby imposing both internal and external pressure to achieve orgasm (Chadwick et al., 2019). The absence of orgasm can lead to stigma and an increased experience of unpleasant, negatively valenced emotions (Fahs and Swank, 2016; Lavie-Ajayi and Joffe, 2009). Therefore, many individuals resort to faking orgasm to alleviate shame and swiftly conclude sexual activity.

By adopting a self-perception perspective during orgasm faking, women may observe their behavior as an external observer, potentially enhancing sexual arousal (Barnett et al., 2019). This pattern was evident in our sample, with a significant association found between the Excitement factor, indicative of intense sexual desire, and faking orgasm to elevate arousal levels, particularly during receiving oral sex.

In the case of women who reported that sexual activity enhances the relationship between partners, our analysis revealed only negligible, albeit statistically significant, correlations with various motivations for faking orgasm (i.e., $r < |0.2|$; Ferguson, 2009). Although Séguin et al. (2018) suggests that faking orgasm for romantic reasons may benefit the relationship, our study does not support this. The lack of correlation is consistent with the premise that faking orgasm is inherently insincere communication (Frith, 2018) and that higher sexual satisfaction relies on honest and anxiety-free communication (Herbenick et al., 2018). These findings suggest that faking orgasm is unlikely to enhance relationship well-being (Csányi et al., 2022) or its long-term maintenance.

5.2.2 Reasons for having sex questionnaire

A complex and multi-faceted relational framework emerges regarding sexual motivations, allowing for a deeper exploration of the various reasons behind orgasm faking and their relationship with motivations for engaging in different sexual activities.

Within the YSEX?-HSF Personal Goal Attainment main scale, which represents egocentric sexual motivations, only the Boosting Self-esteem subscale correlates with certain forms of faking. It can be inferred that subscales such as Seeking Novelty, Infidelity, Impulsiveness, Control and Power, or Revenge are not related to women's orgasm faking. The weak correlation between self-centered sexual motivation and orgasm faking may be attributed to the prevalence of this type of motivation in sexual activities among men rather than women (Meskó et al., 2022). Our results indicate that women tend to fake orgasm during both receiving oral sex and sexual intercourse to elevate their arousal and avoid negative feelings, thereby potentially increasing their self-esteem. Many women experiencing orgasm difficulties encounter distress

and anxiety during sex with their partners (Rowland et al., 2019), which not only negatively affects their quality of life but also their self-esteem, therefore, they may resort to faking orgasm as a coping mechanism (Erdős et al., 2023).

The YSEX?-HSF Relational Reasons main scale, including the Self-affirmation, Care, and Happiness seeking subscales, demonstrates an association with orgasm faking for arousal-enhancing reasons during sexual intercourse. Despite there being no biological difference between clitoral and vaginal orgasm, societal norms often lead women to desire orgasms solely through vaginal penetration (Hoy et al., 2021). According to findings by Impett et al. (2005) and Meston and Buss (2007), participation in sexual activities can increase not only physical pleasure but also foster emotional closeness and commitment at a relational level for women. Although many women report satisfaction without achieving orgasm, there is normative pressure to experience orgasm to feel feminine and normal (Nicolson and Burr, 2003), motivating women to enhance their chances of reaching orgasm by elevating their sexual arousal through self-perception mechanisms (Barnett et al., 2019).

The sexual motivational characteristic of women (Meskó et al., 2022) is evident in the present sample, with the strongest associations related to orgasmic experience found in the Sex as Coping subscale in both oral and sexual intercourse scenarios. Individuals engaging in sexual intercourse to alleviate emotional deficits are more likely to fake orgasm to avoid their own negative feelings or to end the sexual activity. Sexual acts occurring within negative emotional contexts, such as feeling a lack of love or loneliness, play a crucial role in the development of sexual distress (Frith, 2018), enabling individuals to end sexual acts out of habit or obligation without relational tension (Thomas et al., 2017). Our research also confirms that in the sexual domain, women tend to subordinate themselves to their partners and expected norms (Elmerstig et al., 2008; Meskó et al., 2022; Young, 2006), often engaging in sexual intercourse motivated by subordination— prioritizing their partners' needs. We observed the strongest associations with orgasm faking for sexual adjournment, especially in the case of faking during sexual intercourse.

5.2.3 Comparing women who reported faking orgasm to women who had not

The tertiary aim of current study was to assess the replicability of the original version of the Hungarian Faking Orgasm Scale (FOS) with 56 items. Comparing women who reported faking an orgasm with those who reported never faking an orgasm allows us to distinguish between the characteristics of these groups.

As predicted, significant differences were observed in the Distancing and Caring Partner dimensions of the Women's Sexual Working Models Scale in both oral and intercourse

situations. Women who reported faking orgasm exhibited higher scores in the Distancing subscale, aligning with previous research indicating that faking contributes to indifference toward sexual activity and the partner, resulting in decreased relationship satisfaction over time (Csányi et al., 2022). Conversely, women who reported not faking orgasm tend to report greater satisfaction with their sex lives and perceive their partners as more caring, valuing emotional connection over physical satisfaction (Fahs and Plante, 2016). However, contrary to our expectations, no significant differences were observed in behaviors related to negative self-schema and sexual anxiety between the two groups.

Regarding sexual motivations, as expected, significant differences were found between women who reported faking orgasm and those who did not in the YSEX?-HSF Sex as Coping and the Personal Goal Attainment main scales. Women who reported faking orgasm were less likely to engage in sexual activities for relational bonding but rather as a means to enforce their own sexual interests or cope with emotional difficulties. Although men tend to engage in sexual activities for self-centered reasons compared to women (Meskó et al., 2022), our results suggest that, in general, women who reported faking orgasm are more likely to participate in both oral sex and sexual intercourse for personal reasons, such as boosting self-esteem, compared to women who reported not faking orgasm.

Using sex as a coping mechanism is a motivation predominantly observed in women (Meskó et al., 2022), and our findings indicate this is significantly more characteristic of women who reported faking orgasm. This aligns with the mate-retaining elements of coping motivation (Meskó et al., 2022), with faking orgasm itself considered a mate retention strategy (Csányi et al., 2022), allowing women to increase their partner's commitment to the relationship (Impett et al., 2005; Meston and Buss, 2007).

6 Limitations and future directions

The instrument used in current study has several limitations. Firstly, the results and correlations should be interpreted within certain boundaries. While the instrument endeavors to uncover the reasons behind orgasm faking to the best of its ability, it cannot comprehensively address this multifaceted process. For instance, it does not delve into the socio-cultural conditions that may influence women's sexual behavior, nor does it consider potential health issues that could physically hinder reaching orgasm. Despite these limitations, when used in conjunction with other supplementary questionnaires, the Hungarian brief form of the Faking Orgasm Scale for Women (FOS-24) emerges as a highly reliable measurement tool.

Secondly, although the overall sample used in the study was large and relatively diverse, it did not undergo representativeness testing. For instance, the samples may have omitted asexual respondents who might lack interest in participating in a study on sexual behavior. Additionally, self-reported data, while valuable, are inherently susceptible to biases such as social desirability or recall inaccuracies, which could influence participants' responses.

Thirdly, the questionnaire was specifically designed to understand the motives behind orgasm faking among heterosexual women only. It is imperative to develop a measure suitable for studying the faking motives of women with sexual orientations other than heterosexual. This could be achieved by supplementing the instructions, thereby ensuring a broader and more comprehensive understanding of female sexuality.

Finally, future research should explore the scale's applicability across diverse populations and settings. Testing its validity and reliability in different cultural and socio-demographic contexts would provide further insights into its universal utility.

7 Conclusion

The current study significantly contributes to the understanding of faking orgasm, revealing the intersection of sexual behavior, motivation, and working models. The findings suggest key pathways for future research and offer valuable insights applicable in clinical practice with women and couples. Professionals, including psychologists, therapists, gynecologists, psychiatrists, can gain a deeper insight into how sexual working models and sexual motives influence decision-making processes within relationships. By understanding the impact of sexual working models and motivations on sexual decision-making, providers can pose clinically relevant questions and explore different implications for patients. Insights from the study may uncover patterns such as feeling obligated to engage in sexual activity despite a lack of desire or resorting to faking orgasm. Without a precise understanding of sexual decision-making processes, providers risk pathologizing common behaviors that may serve important psychological and relational functions.

Data availability statement

The datasets presented in this study can be found in online repositories. The names of the repository/repositories and accession number(s) can be found below: https://osf.io/96emq/?view_only=8eca7faedc0d4f67848c029eac2a0070.

Ethics statement

The studies involving humans were approved by Hungarian United Ethical Review Committee for Research in Psychology. The studies were conducted in accordance with the local

legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

EC: Writing – original draft, Resources, Project administration, Methodology, Investigation. JB: Writing – original draft, Visualization, Validation, Formal analysis, Data curation. TB: Writing – review and editing, Methodology, Funding acquisition. NM: Writing – review and editing, Supervision, Methodology, Funding acquisition, Conceptualization.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2024.1513959/full#supplementary-material

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Psychometric Evaluation of the Abbreviated Hungarian Faking Orgasm Scale for Women

Supplementary Materials

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Table S1 *Discrimination (a) parameter values for all items in the item response analysis, separately for scales*

Scale	Item nr	*a*	Scale	Item nr	*a*
Oral Sex subscales			Sexual Intercourse subscales		
Altruistic Deceit	6	2.657	Altruistic Deceit	1	2.190
	7	3.420		2	2.268
	8	4.423		**3**	3.249
	9	3.642		**4**	3.181
	10	2.742		5	1.777
	11	2.151		8	2.539
	12	3.118		**9**	2.926
	13	1.904		10	1.453
	14	1.552		11	2.929
Insecure Avoidance	**1**	3.811		12	2.557
	2	2.007		13	.623
	3	1.157		14	2.161
	4	2.276		16	2.194
Elevated Arousal	**16**	2.287		18	.674
	17	1.964	Fear and Insecurity	6	1.119
	18	3.833		**7**	2.316
	19	.614		21	1.734
	20	1.667		**22**	3.033
Fear of Dysfunction	5	.520		23	2.064
	15	3.201		24	1.996
	21	2.755		**25**	3.138
	22	2.506		26	1.917
				27	2.120
				28	1.555
			Elevated Arousal	20	1.079
				29	2.777
				30	2.972
				31	.466
				32	3.201
				33	3.684
				34	3.295
			Sexual Adjournment	**15**	3.560
				17	2.155
				19	1.559

Note: Retained items are in bold.

Hungarian Brief Version of the Faking Orgasm Scale for Women (FOS-24)

A NŐI SZÍNLELET ORGAZMUS KÉRDŐÍV RÖVID MAGYAR VÁLTOZATA

Instrukció: Kérjük, szánjon rá egy percet, hogy átgondolja azt a kapcsolatát, amelyben Ön orgazmust (szexuális kielégülést) színlelt. Most pedig töltse ki az alábbi kérdőívet. Kérjük, válassza ki egy korábbi vagy jelenlegi kapcsolatát, amely egyezik a következő szempontokkal.

Ez a kérdőív az Ön és partnere viselkedésének felmérésére irányul. Tehát nem egy tudáspróbáról van szó, nincsenek jó és rossz válaszok. Kérjük, válaszoljon minden egyes kérdésre olyan pontosan, amilyen pontosan csak tud. Olvassa el valamennyi kérdést gondosan és jelölje be a megfelelő választ.

Egy-egy fogalom meghatározása eltérő lehet a különböző személyek számára. Amellett, hogy tiszteletben szeretnénk tartani az Ön meghatározását, fontosnak tartjuk a kutatási célok elérése érdekében, hogy egységes fogalmakkal rendelkezzünk. Ezért kérjük, – még ha nem is ért egyet velük – hogy használja a következő meghatározásokat, miközben válaszol a kérdésekre.

> **orgazmus**: felfokozott izgalmi állapot; a szexuális izgalommal együtt járó feszültség robbanásszerű csúcspontja, amelyet a férfiaknál az ondó kilövellése kísér, a nőknél pedig vaginális izom-összehúzódások; más szavakkal „elélvezni” vagy „elmenni”.
> **színlelt orgazmus**: annak megjátszása vagy tettetése, hogy valakinek orgazmusa van (pedig nincs), és a cél érdekében izom-összehúzódások és/vagy hangos visszajelzés alkalmazása.

Köszönjük együttműködését és bizalmát, amely igen megtisztelő számunkra.

ORÁLIS SZEX: Kérjük, hogy a következő kérdésekre olyan értelemben válaszoljon, hogy Ön fogadja az orális szexet (amit úgy határozunk meg, mint a nemi szervek izgatása a partner szája, nyelve által)
** Ha a „SOHA” választ adta a „Milyen gyakran színlel orgazmust orális szex alatt?” kérdésre, akkor kérjük, hogy lépje át a következő szakaszt (kérdéseket).
Amikor orgazmust színlel az orális szex alatt, milyen rendszeresen teszi ezt a következő okokból?

1	2	3	4	5
soha	alkalmanként	néha	gyakran	mindig

1. Mert kínosan érzi magát az orális szex közben?
2. Mert fizikailag kényelmetlenül érzi magát orális szex közben?
3. Mert zavarban van?
4. Mert szeretné díjazni a partnere erőfeszítését?
5. Szeretné ezzel partnere önértékelését fokozni?
6. Ettől partnere sikeresebbnek fogja érezni önmagát?
7. Mert szégyelli magát, hogy nem képes elérni orgazmust?
8. Hogy „beindítsa” (felizgassa saját magát)?
9. Mert az gondolja, hogy ez szexi?
10. Hogy fokozza saját érdeklődését a szexuális élményben?
11. Mert aggódik, hogy nem képes elérni az orgazmust?
12. Hogy elkerülje a szexuális és nőgyógyászati egészségével kapcsolatos rossz érzéseket amiatt, hogy nincs valódi orgazmusa?

SZEXUÁLIS KÖZÖSÜLÉS: Kérjük, a következő kérdésekre olyan értelemben válaszoljon, hogy valakivel szexuálisan közösül (a közösülést úgy határozzuk meg, mint a pénisz behatolása a vaginába).

**Megjegyzés: Ha a „SOHA” választ adta a „Milyen gyakran színlel orgazmust szexuális közösülés közben?” kérdésre, akkor kérjük, hogy lépje át a következő szakaszt (kérdéseket).

Amikor orgazmust színlel szexuális közösülés közben, milyen rendszeresen teszi ezt a következő okokból?

1	2	3	4	5
soha	alkalmanként	néha	gyakran	mindig

1. Hogy a partnere sikeresnek érezze önmagát?
2. Hogy megóvja partnerét a csalódottságtól, ha Önnek nincs valódi orgazmusa?
3. Mert aggódik, hogy nem képes elérni az orgazmust?
4. Mert a partnere boldogabb lenne, ha Önnek orgazmusa lett volna közösülés közben?
5. Mert abba akarja hagyni a szexet, de szeretné elkerülni, hogy a partnere kényelmetlenül érezze magát a jövőben?
6. Mert szeretne aludni?
7. Mert egyszerűen nem élvezi az együttlétet?
8. Mert szégyelli magát, hogy nem képes elérni orgazmust?
9. Hogy elkerülje, hogy rosszul érzi magát, ha nincs orgazmusa?
10. Hogy fokozza szexuális élményének izgalmát?
11. Hogy fokozza saját vágyát a közösülés közben?
12. Hogy fokozza a szexuális aktus erősségét?

Kiértékelés:

Női Színlelt Orgazmus Kérdőív rövid változatának (FOS-24) skálái		Tételek
Orális alskála		
	OSAD	4, 5, 6
	OSIA	1, 2, 3
	OSEA	8, 9, 10
	OSFD	7, 11, 12
Közösüléses alskála		
	SIAD	1, 2, 4
	SIFI	3, 8, 9
	SIEA	10, 11, 12
	SISA	5, 6, 7

Megjegyzés: Orális szex alskálák: Altruista színlelés (OSAD); Bizonytalan elkerülés (OSIA); Fokozott izgalom (OSEA); Félelem a diszfunkciótól (OSFD); Szexuális közösülés alskálák: Altruista színlelés (SIAD); Félelem és bizonytalanság (SIFI); Fokozott izgalom (SIEA); Szexuális elhalasztás (SISA)

Table S2 *Factor Loadings of the Hungarian Brief Version of Faking Orgasm Scale for Women (FOS-24)*

Table S2A *Loading of the four factors of the Oral Sex subscales of the Faking Orgasm Scale For Women Hungarian Brief Version*

						95% Confidence Interval	
Factor	*Item nr*	*Std. Esti-mate*	*Std. Error*	*z-value*	*p*	*Lower*	*Upper*
Altruistic Deceit	4	.859	.042	2.275	< .001	.776	.942
	5	1.074	.038	28.080	< .001	.999	1.149
	6	1.047	.039	27.035	< .001	.971	1.123
Insecure Avoidance	1	1.010	.048	21.188	< .001	.916	1.103
	2	.718	.053	13.440	< .001	.613	.822
	3	1.081	.060	17.970	< .001	.963	1.199
Elevated Arousal	8	.989	.046	.046	< .001	.898	1.080
	9	.832	.052	16.037	< .001	.730	.933
	10	1.035	.046	22.708	< .001	.946	1.124
Fear of Dys-function	7	1.324	.048	27.776	< .001	1.230	1.417
	11	1.057	.053	2.080	< .001	.954	1.160
	12	.756	.055	13.826	< .001	.649	.863

Table S2B *Loading of the four factors of the Sexual Intercourse subscales of the Faking Orgasm Scale for Women Hungarian Brief Version*

						95% Confidence Interval	
Factor	*Item nr*	*Std. Estimate*	*Std. Error*	*z-value*	*p*	*Lower*	*Upper*
Altruistic Deceit	1	.962	.041	23.616	< .001	.882	1.041
	2	1.051	.041	25.869	< .001	.972	1.131
	4	.923	.043	21.521	< .001	.839	1.007
Fear and Insecurity	3	1.115	.039	28.388	< .001	1.038	1.192
	8	1.120	.038	29.290	< .001	1.045	1.195
	9	1.020	.043	23.796	< .001	.936	1.104
Elevated Arousal	10	1.058	.032	32.847	< .001	.995	1.121
	11	1.088	.032	33.763	< .001	1.025	1.151
	12	1.088	.031	35.160	< .001	1.028	1.149
Sexual Adjournment	5	1.285	.060	21.393	< .001	1.167	1.403
	6	.681	.043	15.705	< .001	.596	.766
	7	.743	.048	15.415	< .001	.649	.838

Table S3 *The results of the Mann Whitney U test for women who reported having faking orgasm during receiving oral sex and sexual intercourse in terms of sexual working models and sexual motivations (N = 768)*

		24-item Hungarian Faking Orgasm Scale for Women (current study)		*56-item Hungarian Faking Orgasm Scale for Women (Csányi et al., 2024)*	
		Receiving oral sex			
		U	*ES*	*U*	*ES*
WSWMS	**Guilt and Shame**	72918	.009	67224	.013
	Maintain the Bond	73039	.008	67461	.009
	Distancing	61221***	.168	57906***	.149
	Caring Partner	66521*	.096	61760*	.093
	Excitement	71455	.029	67483	.009
YSEX-HSF	**Personal Goal Attainment**	64175**	.128	57464***	.156
	Relational Reasons	71498	.029	63777	.063
	Sex As Coping	59663***	.189	50613***	.256
		Sexual intercourse			
		U	*ES*	*U*	*ES*
WSWMS	**Guilt and Shame**	72918	.009	72918	.009
	Maintain the Bond	73039	.007	73039	.007
	Distancing	61221***	.168	61221***	.168
	Caring Partner	66521*	.096	66521*	.096
	Excitement	71455	.029	71455	.029
YSEX-HSF	**Personal Goal Attainment**	64175**	.128	64175**	.128
	Relational Reasons	71498	.029	71498	.028
	Sex As Coping	59663***	.189	59663***	.189

Note: * $p < .05$, ** $p < .01$, *** $p < .001$; WSWMS = Women's Sexual Working Models Scale; YSEX?-HSF = Reasons for Having Sex Questionnaire Hungarian Short Form.

Table S4.A *Sexual working models and motivation of women who reported having ever faked an orgasm compared to women who reported having never faked an orgasm during receiving oral sex; descriptives (M, SD) for WSWMS, YSEX?-HSF and results of analyses of Mann Whitney U-test in 24-item and 56-item Hungarian Faking Orgasm Scale for Women*

		24-item Hungarian Faking Orgasm Scale for Women (current study)				*56-item Hungarian Faking Orgasm Scale for Women (Csányi et al., 2024)*			
		Women Who Reported Having Ever Faked an Orgasm During Receiving Oral Sex	*Women Who Reported Having Never Faked an Orgasm During Receiving Oral Sex*			*Women Who Reported Having Ever Faked an Orgasm During Receiving Oral Sex*	*Women Who Reported Having Never Faked an Orgasm During Receiving Oral Sex*		
		M (SD)	*M (SD)*	*U*	*ES*	*M (SD)*	*M (SD)*	*U*	*ES*
WSWMS	**Guilt and Shame**	7.40 (3.15)	7.67 (3.70)	72918	.009	7.27 (2.77)	7.70 (3.77)	67224	.013
	Maintain the Bond	25.34 (4.38)	24.98 (5.01)	73039	.008	25.41 (4.22)	25.00 (4.98)	67461	.009
	Distancing	8.29 (3.94)	7.34 (3.75)	61221***	.168	8.42 (4.11)	7.44 (3.68)	57906***	.149
	Caring Partner	17.81 (3.00)	18.23 (2.89)	66521*	.096	17.71 (3.03)	18.21 (2.89)	61760*	.093
	Excitement	16.45 (3.16)	16.21 (3.39)	71455	.029	16.25 (3.38)	16.37 (3.23)	67483	.009
YSEX-HSF	**Personal Goal Attainment**	44.21 (12.7)	42.10 (14.01)	64175**	.128	45.05 (13.04)	42.02 (13.54)	57464***	.156
	Seeking novelty	8.09 (3.01)	7.53 (3.05)	66043*	.103	8.19 (2.96)	7.58 (3.07)	59927**	.120
	Conformity	3.41 (1.2)	3.51 (1.25)	69186*	.060	3.53 (1.36)	3.42 (1.15)	66952*	.017
	Infidelity	3.64 (1.58)	3.54 (1.56)	71519	.028	3.71 (1.71)	3.52 (1.48)	64342	.055
	Impulsiveness	6.15 (2.95)	5.75 (2.96)	67114*	.088	6.18 (2.97)	5.81 (2.95)	62709	.079
	Revenge	3.77 (1.81)	3.62 (1.84)	68670*	.067	3.94 (2.03)	3.56 (1.69)	59931***	.120
	Seeking sensation	8.02 (3.25)	7.61 (3.45)	67881	.078	8.07 (3.29)	7.66 (3.39)	63160	.072
	Control and power	4.45 (2.41)	4.29 (2.63)	68245*	.073	4.55 (.51)	4.26 (2.53)	62136*	.087
	Boosting self-esteem	6.68 (3.34)	6.24 (3.56)	65645**	.108	6.88 (3.42)	6.20 (3.46)	58742**	.137

Relational Reasons	88.77 (19.73)	87.37 (2.56)	71498	.029	89.88 (18.53)	87.00 (2.99)	63777	.063
Sexual desire	12.00 (3.10)	11.50 (3.51)	68845	.065	12.00 (3.06)	11.60 (3.47)	64929	.046
Commitment	1.99 (3.78)	1.76 (3.87)	70924	.036	11.28 (3.66)	1.64 (3.90)	61454*	.097
Physical attraction	9.37 (3.23)	9.35 (3.60)	73546	9.51e-4	9.22 (3.21)	9.43 (3.54)	65481	.038
Relaxation	8.09 (3.54)	7.90 (3.56)	71526	.028	7.95 (3.43)	8.01 (3.62)	67695	.006
Intimacy	12.12 (2.92)	12.26 (3.01)	70565	.041	12.17 (2.81)	12.20 (3.05)	66350	.025
Excitement	8.66 (3.22)	8.55 (3.54)	71978	.022	8.87 (3.18)	8.45 (3.50)	63427	.068
Self-affirmation	6.57 (3.28)	6.64 (3.03)	71121	.034	6.78 (3.17)	6.51 (3.14)	64459	.053
Care	9.18 (3.45)	8.84 (3.42)	69523	.055	9.59 (3.35)	8.67 (3.44)	57531***	.155
Happiness seeking	11.80 (3.00	11.58 (3.10)	70405	.044	12.02 (2.89)	11.49 (3.13)	61582**	.095
Sex As Coping	4.70 (13.48)	36.74 (12.34)	59663***	.189	42.12 (13.68)	36.67 (12.25)	50613***	.256
Mitigating emotional deficit	7.05 (3.57)	6.63 (3.83)	66614*	.095	7.38 (3.74)	6.52 (3.66)	58276***	.144
Compulsion and avoidance	5.58 (2.55)	4.80 (2.07)	60420***	.179	5.73 (2.51)	4.86 (2.19)	52878***	.223
Utilitarianism	3.58 (1.59)	3.41 (1.36)	69775	.052	3.69 (1.77)	3.38 1.27)	62454**	.083
Coping with relational conflicts	7.01 (3.29)	6.22 (3.23)	62496***	.151	7.26 (3.40)	6.22 (3.16)	55563***	.184
Submissiveness	6.70 (3.05)	6.32 (2.83)	67823*	.078	6.91 (3.06)	6.27 (2.86)	58040***	.147
Coping with partner's emotional demands	4.32 (2.16)	4.01 (1.69)	69334	.058	4.47 (2.22)	3.98 (1.73)	59172***	.131
Mate retention	6.46 (3.48)	5.35 (3.04)	59519***	.192	6.68 (3.52)	5.43 (3.09)	53223***	.218

Notes: * $p < .05$ ** $p < .01$ *** $p < .001$; WSWMS = Women's Sexual Working Models Scale; YSEX?-HSF = Reasons for Having Sex Questionnaire, Hungarian Short Form (YSEX?-HSF).

Table S4B *Sexual working models and motivation of women who reported having ever faked an orgasm compared to women who reported having never faked an orgasm during sexual intercourse; descriptives (M, SD) for WSWMS, YSEX?-HSF and results of analyses of Mann Whitney U-test in 24-item and 56-item Hungarian Faking Orgasm Scale for Women*

		24-item Hungarian Faking Orgasm Scale for Women (current study)				*56-item Hungarian Faking Orgasm Scale for Women (Csányi et al., 2024)*			
		Women Who Reported Having Ever Faked an Orgasm During Sexual Intercourse	*Women Who Reported Having Never Faked an Orgasm During Sexual Intercourse*			*Women Who Reported Having Ever Faked an Orgasm During Sexual Intercourse*	*Women Who Reported Having Never Faked an Orgasm During Sexual Intercourse*		
		M (SD)	*M (SD)*	*U*	*ES*	*M (SD)*	*M (SD)*	*U*	*ES*
WSWMS	**Guilt and Shame**	7.40 (3.15)	7.67 (3.70)	72918	.009	7.40 (3.15)	7.67 (3.70)	72918	.009
	Maintain the Bond	25.34 (4.38)	24.98 (5.01)	73039	.007	25.34 (4.38)	24.98 (5.01)	73039	.007
	Distancing	8.29 (3.94)	7.34 (3.75)	61221***	.168	8.29 (3.94)	7.34 (3.75)	61221***	.168
	Caring Partner	17.81 (3.0)	18.23 (2.89)	66521*	.096	17.81 (3.0)	18.23 (2.89)	66521*	.096
	Excitement	16.45 (3.16)	16.21 (3.39)	71455	.029	16.45 (3.16)	16.21 (3.39)	71455	.029
YSEX-HSF	**Personal Goal Attainment**	44.21 (12.70)	42.10 (14.01)	64175**	.128	44.21 (12.70)	42.10 (14.01)	64175**	.128
	Seeking novelty	8.09 (3.01)	7.53 (3.05)	66043*	.103	8.09 (3.01)	7.53 (3.05)	66043*	.128
	Conformity	3.41 (1.20)	3.51 (1.25)	69186*	.060	3.41 (1.20)	3.51 (1.25)	69186*	.060
	Infidelity	3.64 (1.58)	3.54 (1.56)	71519	.028	3.64 (1.58)	3.54 (1.56)	71519	.028
	Impulsiveness	6.15 (2.95)	5.75 (2.96)	67114*	.088	6.15 (2.95)	5.75 (2.96)	67114*	.088
	Revenge	3.77 (1.81)	3.62 (1.84)	68670*	.067	3.77 (1.81)	3.62 (1.84)	68670*	.067
	Seeking sensation	8.02 (3.25)	7.61 (3.45)	67881	.078	8.02 (3.25)	7.61 (3.45)	67881	.077
	Control and power	4.45 (2.41)	4.29 (2.63)	68245*	.073	4.45 (2.41)	4.29 (2.63)	68245*	.073
	Boosting self-esteem	6.68 (3.34)	6.24 (3.56)	65645*	.108	6.68 (3.34)	6.24 (3.56)	65645*	.108

Relational Reasons	88.77 (19.73)	87.37 (2.56)	71498	.028	88.77 (19.73)	87.37 (2.56)	71498	.028
Sexual desire	12.00 (3.10)	11.50 (3.51)	68845	.064	12.00 (3.10)	11.50 (3.51)	68845	.064
Commitment	1.99 (3.78)	1.76 (3.87)	70924	.036	1.99 (3.78)	1.76 (3.87)	70924	.036
Physical attraction	9.37 (3.23)	9.35 (3.60)	73546	9.51e-4	9.37 (3.23)	9.35 (3.60)	73546	9.51e-4
Relaxation	8.09 (3.54)	7.90 (3.56)	71526	.028	8.09 (3.54)	7.90 (3.56)	71526	.028
Intimacy	12.12 (2.92)	12.26 (3.01)	70565	.041	12.12 (2.92)	12.26 (3.01)	70565	.041
Excitement	8.66 (3.22)	8.55 (3.54)	71978	.022	8.66 (3.22)	8.55 (3.54)	71978	.022
Self-affirmation	6.57 (3.28)	6.64 (3.03)	71121	.034	6.57 (3.28)	6.64 (3.03)	71121	.034
Care	9.18 (3.45)	8.84 (3.42)	69523	.055	9.18 (3.45)	8.84 (3.42)	69523	.055
Happiness seeking	11.80 (3.0)	11.58 (3.1)	70405	.043	11.80 (3.0)	11.58 (3.1)	70405	.043
Sex As Coping	4.70 (13.48)	36.74 (12.34)	59663***	.189	4.70 (13.48)	36.74 (12.34)	59663***	.189
Mitigating emotional deficit	7.05 (3.57)	6.63 (3.83)	66614*	.095	7.05 (3.57)	6.63 (3.83)	66614*	.095
Compulsion and avoidance	5.58 (2.55)	4.80 (2.07)	60420***	.179	5.58 (2.55)	4.80 (2.07)	60420***	.179
Utilitarianism	3.58 (1.59)	3.41 (1.36)	69775	.052	3.58 (1.59)	3.41 (1.36)	69775	.052
Coping with relational conflicts	7.01 (3.29)	6.22 (3.23)	62496***	.151	7.01 (3.29)	6.22 (3.23)	62496***	.151
Submissiveness	6.70 (3.05)	6.32 (2.83)	67823*	.078	6.70 (3.05)	6.32 (2.83)	67823*	.078
Coping with partner's emotional demands	4.32 (2.16)	4.01 (1.69)	69334	.058	4.32 (2.16)	4.01 (1.69)	69334	.058
Mate retention	6.46 (3.48)	5.35 (3.04)	59519***	.191	6.46 (3.48)	5.35 (3.04)	59519***	.191

Notes: * $p < .05$ ** $p < .01$ *** $p < .001$; WSWMS = Women's Sexual Working Models Scale; YSEX?-HSF = Reasons for Having Sex Questionnaire, Hungarian Short Form (YSEX?-HSF)

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4.2 The Relationship Between Dimensions of Adult Attachment and Motivation for Faking Orgasm in Women[14]

András Láng[1], Erin B. Cooper[2], Norbert Meskó[1]*

[1]Institute of Psychology, University of Pécs

[2]Westside Behavioral Health, Westlake, Ohio

*Corresponding author

Abstract

Attachment and sexual behavior are both integral parts of adult romantic relationships. Attachment avoidance is linked to impersonal, egocentric sexual activities, whereas the sexuality of anxiously attached individuals revolves around relationship maintenance and the needs of the partner. In this attachment context, faking orgasm might serve as a means for relational regulation. The aim of our study was to investigate the links between dimensions of adult attachment and motives for faking orgasm in women. Young women completed measures of adult attachment and motivations for faking orgasm. Both attachment avoidance and attachment anxiety were related to the use of faked orgasm as a means to avoid negative, shameful feelings. Attachment avoidance was significantly associated with the intention to quickly end sexual intercourse through faking orgasm. Attachment anxiety was associated with the use of faked orgasm to increase sexual arousal and to elevate partners' self-esteem. Results are discussed with regard to relational and sexual goals associated with adult attachment orientations.

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Introduction

Female orgasm is a complex biopsychosocial phenomenon that significantly impacts a woman's life and relationship quality. Many women make the decision to fake orgasm (Muehlenhard & Shippee, 2010), a phenomenon gaining interest among researchers (e.g., Cooper, Fenigstein, & Fauber, 2014; Fahs, 2014). In this study, we employed an adult attachment framework to investigate the relationship between dimensions of adult attachment and women's motives for faking orgasm.

Faking Orgasm in Women

Muehlenhard and Shippee (2010) argued that both popular culture and the tendency toward "medicalization" of the female sexual response have had a detrimental effect on perceptions of "normal" female sexual functioning. Up to 90% of women do not orgasm consistently with a partner, and approximately 10% do not experience orgasm at all (Bancroft, Loftus, & Long, 2003). In one study, nearly two- thirds of women reported having faked an orgasm with a partner (Muehlenhard & Shippee, 2010).

Faking orgasm has been associated with the following themes: enhancing partner's confidence in sexual skills, preventing the emergence of own and partner's unwanted thoughts and feelings, and strategically altering partner's behavior (Cooper et al., 2014; Fahs, 2014; McCoy, Welling, & Shackelford, 2015). According to Cooper et al. (2014), women may fake orgasm during sexual intercourse and oral sex for numerous reasons. Their research found that women may choose to fake orgasm during intercourse to protect their partners' self-esteem; to avoid thoughts/feelings of anxiety, self-consciousness, and physiological abnormality; to end sex quickly; or to enhance their own sexual experience (Cooper et al., 2014). Furthermore, Nicolson and Burr (2003) suggested that women are more concerned with their orgasm for the sake of their male partners than for their own sake. Thus, investigating female orgasm, authentic or faked, is best done in an interpersonal context—here, in the context of adult attachment.

Attachment Orientation and Sexual Behavior

Attachment is the earliest social-behavioral system (Cassidy, 2008). As such, attachment experiences might later affect developing sexual behavior (Shaver & Mikulincer, 2012). Although attachment needs—an emotional bond to a wiser and stronger figure (Bowlby, 1969)—are usually directed toward caregivers in infancy and childhood, romantic partners become the most important attachment figures in adolescence (Bartholomew & Horowitz, 1991). Most researchers agree that individuals can be characterized by their relative positions on two dimensions: attachment anxiety and attachment avoidance (Bartholomew & Horowitz, 1991).

Attachment anxiety is fear of separation from significant others and one's representation and evaluation of the self. Attachment avoidance is discomfort with and avoidance of intimacy; the representation and evaluation of significant others are reflected in that avoidance.

Attachment avoidance leads to the deactivation of the attachment behavioral system (Shaver & Mikulincer, 2002). This deactivation serves to prevent subsequent frustrations stemming from seeking comfort with a rejecting attachment figure. Conversely, attachment anxiety is related to the hyperactivation of the attachment behavioral system, which operates to draw the attention of a responsive but unpredictable attachment figure. The relative absence of both attachment avoidance and attachment anxiety can be considered to be an indirect indicator of secure attachment in this model.

Since the 1980s there has been a growing body of empirical research investigating the interrelatedness of attachment and sexuality (for a review, see Shaver & Mikulincer, 2012). Individuals with secure attachment maintain a healthy interdependence of sexuality and attachment (Shaver & Mikulincer, 2012). They prefer sexual activities in the context of committed relationships (Brennan & Shaver, 1995) and experience mutual intimacy, gratification, and satisfaction in these relationships (Barnes, Dodson, Wood, Thomas, & Kimberly, 2017; Birnbaum, Reis, Mikulincer, Gillath, & Orpaz, 2006).

In contrast, the relationship between attachment and sexuality is disrupted in individuals with insecure attachment orientations. Avoidant attachment—the segregation of sexual behavior and attachment needs—is manifested by infrequent sexual activity with relationship partners (Brassard, Shaver, & Lussier, 2007; Dunkley, Dang, Chang, & Gorzalka, 2016) and impersonal, alienated, and detached sexual fantasies (Birnbaum, 2007b). Avoidant individuals tend to have sex to conform to peer pressure and for self-enhancing reasons (Schachner & Shaver, 2004). Moreover, Davis, Shaver, and Vernon (2004) found that attachment avoidance was also positively related to engaging in sexual activity to reduce insecurity and stress.

In anxious individuals, sexual and attachment behaviors are inextricably enmeshed. This results in experiencing strong sexual urges in situations that are known to elicit attachment behavior (Davis et al., 2004); in having frequent romance- related sexual fantasies (Birnbaum, 2007b; Jones & Curtis, 2017); and in the use of sex as a means to feel valued by partners, to feel confident and desirable, and to cope with negative situations (Schachner & Shaver, 2004). Moreover, anxious individuals use sex as a barometer of relationship status; they actively seek cues of relationship threat, and during sex they focus more on their partners' needs than on their own to avoid abandonment (Davis et al., 2006).

Aims of the Study and Hypotheses

Few studies have addressed the relationship between female orgasm and attachment (Ciocca et al., 2015; Cohen & Belsky, 2008; Costa & Brody, 2011), and no study to date has investigated the relationship between adult attachment and women's decision to fake orgasm. The specific intentions behind a faked orgasm may be the function of an underlying attachment style that represents a general attitude toward romantic and sexual relationships and partners. To investigate these relationships, we formulated the following hypotheses.

H1: Because avoidant attachment is associated with decreased sexual desire and orgasm frequency (Cohen & Belsky, 2008), we expected women who reported having ever faked an orgasm to be more avoidant than women who reported having never faked an orgasm.

H2: Because both anxious and avoidant attachment are associated with sexual insecurities, we expected both anxious and avoidant attachment to be associated with faking orgasm to suppress negative and shameful feelings associated with sexuality.

H3: Given the characteristics of avoidant attachment (e.g., decreased sexual desire and interest, negative view of sexual partners), we expected avoidant attachment to be specifically associated with quickly ending sexual intercourse through faking orgasm (i.e., sexual adjournment; see Cooper et al., 2014).

H4: The most common reason given by heterosexual women who reported having faked an orgasm was to make their male partners happy and to give them an "ego boost" (Cooper et al., 2014), and there is a positive relationship between sex frequency and relationship satisfaction for men who reported a high rate of partners' orgasm during sex (Ellsworth & Bailey, 2013). Anxious attachment is associated with fear of abandonment and negative representation of the self as romantic partner (Bartholomew & Horowitz, 1991), and these individuals tend to use sex as a means to increase feelings of connectedness (Birnbaum, 2007a). Therefore, we expected anxious attachment to be specifically associated with faking orgasm to increase the emotional investment and physical proximity of male sexual partners. This was expected to happen either directly through giving an "ego boost" to male partners (i.e., altruistic deceit; see Cooper et al., 2014) or indirectly through the pretense of increased sexual satisfaction (i.e., elevated arousal; see Cooper et al., 2014).

No specific hypotheses were made regarding the exploratory nature of our study, in other words, the differences between faking orgasm during sexual intercourse and oral sex.

Method

Participants and Procedure

A total of 348 women participated in our study. Their ages ranged from 18 to 59 years (M = 25.51; SD = 7.86). Participants were recruited from Hungarian blogs on women's health and completed questionnaires online via SurveyMonkey. Each participant gave informed consent, and no participant was rewarded for participating. Measures were presented in the order they appear in the sections that follow.

The relationship status of the participants was as follows: 4.3% reported no current relationship, 16.1% reported having casual sexual relationships with multiple partners, 6.3% reported dating someone, 39.1% reported cohabiting with a partner, 23.9% reported being married, and 10.3% reported an other relational status (e.g., friends with benefits, long-distance relationship). Almost 79% of the participants had an exclusively heterosexual orientation on a 7-point Likert scale (from Exclusively heterosexual to Exclusively homosexual; Kinsey, Pomeroy, & Martin, 1948). The study received ethical approval from the United Ethical Review Committee for Research in Psychology (Ref. No. 2017/20).

Demographics

Prior to completion of the questionnaires, participants reported their age, sexual orientation, and current relationship status. Participants were asked whether they had ever faked orgasm during sexual intercourse and/or while receiving oral sex. In addition, participants were asked to choose their most applicable relationship for the purpose of completing the Faking Orgasm Scale for Women (FOS; Cooper et al., 2014) (i.e., to select a current or past relationship in which they faked orgasm, if ever).

Faking Orgasm Scale for Women

The FOS (Cooper et al., 2014) is a 61-item self-report measure designed to examine women's motivation for faking orgasm during sexual intercourse (35 items; sexual intercourse subscale) and while receiving oral sex (26 items; oral sex subscale). Participants responded to open- ended questions and indicated their agreement with the items on a 5-point Likert-type scale ranging from Never to Always.

Only participants who reported faking orgasm during sexual intercourse (n = 176) completed the sexual intercourse subscale, which included four dimensions: (1) altruistic deceit (sexual intercourse altruistic deceit, abbreviated as SIAD) measures the respondent's concern for a partner's feelings as motivation for faked orgasm during sexual intercourse (e.g., "To make your partner happy") (Cronbach's $\alpha = .91$); (2) fear and insecurity (SIFI) measures whether

women are motivated to fake orgasm to avoid negative emotions (e.g., “Because you are ashamed you cannot reach orgasm”) (Cronbach’s α = .90); (3) elevated arousal (SIEA) measures women’s tendency to use faked orgasm to increase their own arousal during sexual intercourse (e.g., “To turn yourself on”) (Cronbach’s α = .91); and (4) sexual adjournment (SISA) refers to faked orgasm as a means of quickly ending sexual intercourse (e.g., “Because you simply are not enjoying yourself”) (Cronbach’s α = .78).

Only participants who reported faking orgasm during oral sex (n = 128) completed the oral sex subscale, which included four dimensions: (1) altruistic deceit (oral sex altruistic deceit, abbreviated as OSAD) measures the respondent’s concern for a partner’s feelings as motivation for faked orgasm while receiving oral sex (e.g., “Because you want to reward your partner for their effort”) (Cronbach’s α = .93); (2) insecure avoidance (OSIA) measures whether women are motivated to fake orgasm to avoid negative, anxiety-like emotions (e.g., “Because you are embarrassed during oral sex”) (Cronbach’s α = .72); (3) elevated arousal (OSEA) measures women’s tendency to use faked orgasm to increase their own arousal while receiving oral sex (e.g., “Because you think it is sexy”) (Cronbach’s α = .80); and (4) fear of dysfunction (OSFD) refers to faked orgasm as a means of avoiding negative feelings associated with sexual health or inadequate sexual response (e.g., “Because you are ashamed you cannot reach orgasm”) (Cronbach’s α = .80).

Experiences in Close Relationships Scale—Short Form

The Experiences in Close Relationships Scale—Short Form (ECR-S; Wei, Russell, Mallinckrodt, & Vogel, 2007) is a 12-item measure of adult attachment. Items refer to experiences with romantic partners in general. Respondents used a partly anchored 7-point Likert scale (1 = Disagree strongly; 4 = Neutral/mixed; 7 = Agree strongly). The scale consists of two continuous attachment dimensions.

Attachment avoidance (six items; e.g., “I try to avoid getting too close to my partner”) (Cronbach’s α = .77) measures avoidance of intimacy with romantic partners, whereas attachment anxiety (six items; e.g., “I get frustrated if roman- tic partners are not available when I need them”) (Cronbach’s α = .72) measures anxiety evoked by the real or imagined separation from romantic partners.

Statistical Analyses

Besides descriptive statistics, analyses of variance were used to compare the age and the scores on attachment dimensions of women who had ever faked orgasm while receiving oral sex or intercourse with women who had never faked orgasm. Pearson’s correlations and

multiple linear regressions were used to test the relationship between motivations of faking orgasm and dimensions of adult attachment.

Table 1 *Descriptive statistics of the FOS Scale variables (M, SD) and relationship between motivations for faked orgasm and adult attachment dimensions; results of Pearson's correlations (r) and multiple linear regressions (β) controlling for age and the other adult attachment dimension.*

FOS Scales		M (SD)	Attachment Avoidance		Attachment Anxiety		R^2 (F)
			r	β	r	β	
FOS Sexual Intercourse	Altruistic Deceit	37.86 (12.07)	.18**	.13	.30***	.27***	.11*** (7.384)
	Fear and Insecurity	18.81 (8.48)	.26***	.22**	.24**	.20**	.11*** (6.866)
	Elevated Arousal	11.23 (5.49)	.07	.05	.13	.12	.02 (1.431)
	Sexual Adjournment	5.93 (3.09)	.30***	.28***	.13	.08	.13*** (8.318)
FOS Oral sex	Altruistic Deceit	29.89 (9.43)	.03	- .00	.29**	.29**	.08* (3.781)
	Insecure Avoidance	8.63 (3.28)	.18*	.16	.22*	.20*	.07* (3.274)
	Elevated Arousal	7.57 (3.21)	.14	.10	.25**	.24**	.09** (4.284)
	Fear of Dysfunction	5.48 (3.07)	.22*	.18*	.33***	.31***	0.14*** (6.904)

Note: * $p < .05$; ** $p < .01$; *** $p < .001$. R2 values show the variance of FOS scales explained by attachment avoidance, attachment anxiety, and age.

Results

Descriptive statistics for the FOS scales and adult attachment are presented in Tables 1 and 2, respectively. Comparison of women who had ever faked orgasm while receiving oral sex with women who had not revealed a significant difference in attachment avoidance (Table 2a). Women who reported faking orgasm while receiving oral sex were more avoidant of intimacy than women who reported never faking orgasm. The same comparison with respect to sexual intercourse revealed significant differences in attachment avoidance (Table 2b). Women who reported faking orgasm during sexual intercourse were more avoidant of intimacy than women who reported never faking orgasm.

The relationship between dimensions of adult attachment and motives for faking orgasm were tested with Pearson's correlations and linear regressions. Correlation coefficients and standardized β coefficients (controlling for age and the remaining attachment dimension) are presented in Table 1. Because both attachment avoidance and attachment anxiety share a

common lack of attachment security, only results where both correlation and standardized β coefficients were significant are reported in the text. Variance inflation factor (VIF) values were below 1.05 for all predictor variables, indicating the absence of harmful multicollinearity.

Women who reported an increased avoidance of intimacy were more likely to fake orgasm during sexual intercourse to avoid negative emotions connected to the absence of a real orgasm and to quickly end sexual intercourse. These women were also more likely to fake orgasm while receiving oral sex to avoid negative feelings associated with sexual health or inadequate sexual response.

On the other hand, women who reported more intense separation anxiety were more likely to fake orgasm during sexual intercourse to praise the efforts of the partner and to avoid negative emotions resulting from not actually reaching orgasm. These women were also more likely to fake orgasm during oral sex to boost their partners' confidence, to avoid being preoccupied with negative feelings associated with the sexual act, to increase their own arousal through faking orgasm, and to avoid negative feelings related to concern about gynecological health or inadequate sexual response. Age was a significant predictor only for sexual adjournment during sexual intercourse ($n = 176$; standardized $\beta = .179$; $p < .05$). Older women faked orgasm more frequently to quickly end sexual intercourse.

Table 2.A *Adult attachment of women who reported having ever faked an orgasm compared to women who reported to having never faked an orgasm during receiving oral sex; descriptives (M, SD) for adult attachment dimensions and results of ANOVAs*

	Total sample (*N* = 348)		Women who reported having ever faked an orgasm during receiving oral sex (n = 128)		Women who reported having never faked an orgasm during receiving oral sex (n = 220)		*F*	*p*	Cohen's *d*
	M	*SD*	*M*	*SD*	*M*	*SD*			
Attachment avoidance	12.79	6.05	13.88	6.17	12.16	5.90	6.670	.010	.29
Attachment anxiety	22.82	7.06	22.63	6.74	22.94	7.25	.162	.688	.05

Table 2.B *Adult attachment of women who reported having ever faked an orgasm compared to women who reported having never faked an orgasm during sexual intercourse; descriptives (M, SD) for adult attachment dimensions and results of ANOVAs*

	Total sample (N = 348)		Women who reported having ever faked an orgasm during sexual intercourse (n = 176)		Women who reported having never faked an orgasm during sexual intercourse (n = 172)		*F*	*p*	Cohen's *d*
	M	*SD*	*M*	*SD*	*M*	*SD*			
Attachment avoidance	12.79	6.05	13.76	6.30	11.81	5.64	9.219	.003	.33
Attachment anxiety	22.82	7.06	22.97	6.95	22.68	7.18	.142	.706	.04

Discussion

Our study was the first to investigate the relationship between dimensions of adult attachment and motivations for faking orgasm in women. Results supported our hypotheses and are in line with previous studies on the relationship between attachment orientations and varying aspects of sexuality. Results are discussed in detail in the sections that follow.

Comparing Women Who Reported Faking Orgasm to Women Who Had Not

Women who reported having ever faked orgasm while receiving oral sex showed more avoidant attachment in close relationships than women who reported having never faked orgasm. The same result was replicated with respect to faking orgasm during sexual intercourse. These results support hypothesis 1.

Based on their discomfort with intimacy, avoidant women have a relative preference for impersonal, uncommitted sexual relationships (Birnbaum, 2010). Because women in committed romantic relationships report a higher frequency of orgasm (Costa & Brody, 2007), relative infrequency of orgasm might motivate avoidant women to fake orgasm while receiving oral sex or engaging in sexual intercourse. However plausible these interpretations are, we did not ask our participants about orgasm frequency. Thus, the mediating role of orgasm frequency in the avoidance-faking orgasm relationship should be tested in future studies.

Motivations for Faking Orgasm Related to Attachment Insecurity in General

As predicted in hypothesis 2, women with both more avoidant and more anxious attachment used faking orgasm while receiving oral sex and during sexual intercourse to avoid negative emotions and feelings related to sexual health and to inadequate sexual response (SIFI, OSFD). Because insecurely attached women cannot rely on their partners to achieve feelings of security, they turn to secondary strategies such as deactivation or hyperactivation of attachment signals and behavior (Shaver & Mikulincer, 2002) to reduce anxiety. Faking orgasm might serve as a means to enact these strategies, as discussed in detail in the next section.

Motivations for Faking Orgasm Associated With Attachment Avoidance

As predicted in hypothesis 3, women with more avoidant attachment used faking orgasm as a means of quickly ending sexual intercourse (SISA). This result is consistent with several —especially motivational— aspects of avoidant individuals' sexuality. Attachment avoidance is associated with discomfort of closeness (Brassard et al., 2007). Consequently, the physical intimacy involved in penile-vaginal sexual intercourse might be disturbing for women with avoidant attachment. At the same time, avoidant individuals are also motivated to conform to peer norms (i.e., engaging in sexual activity), both in general and in the field of sexuality

(Schachner & Shaver, 2004). Thus, faking orgasm to quickly end sexual intercourse might be a means to adhere to peers' expectations and escape the inconvenient situation of physical closeness at the same time. This pattern also fits well with the overall deactivating strategy of avoidant individuals (Shaver & Mikulincer, 2002).

Motivations for Faking Orgasm Associated With Attachment Anxiety

Consistent with hypothesis 4, women with more anxious adult attachment faked orgasm both while receiving oral sex and during sexual intercourse because they were concerned with the feelings and self-esteem of their partners (OSAD, SIAD). Women with more anxious adult attachment also faked orgasm while receiving oral sex to increase their own arousal (OSEA). These motives are in line with the overall hyperactivating strategy of anxiously attached individuals (Shaver & Mikulincer, 2002). This strategy is mostly composed of the anxious individuals' trials to maintain the constant attention of the attachment figure and to avoid abandonment. In a sexual context, this strategy might be composed of two aspects. First, women may try to appear more sexually attractive. This might be achieved through increasing their own arousal during sexual encounters (Clark & Hatfield, 1989). Second, they may try to ensure that the sexual activity is as pleasurable as possible for their partners. Besides physical pleasure, increase in their self-esteem resulting from being able to sexually satisfy a woman might be another means to retain male partners (Buss, 1988). Both having a sexually attractive partner and having positive self-esteem would be helpful in mate retention, because both factors could increase relationship satisfaction in men. Further, increased satisfaction could make men less motivated to search for alternative sexual partners.

Moreover, motivation to fake orgasm during oral sex to avoid embarrassment (OSIA) was also specifically related to attachment anxiety. Both giving and receiving oral sex is generally perceived as less intimate than sexual intercourse, especially by women (Chambers, 2007). This perceived lack of intimacy can be especially problematic for women with anxious attachment who use sex to please their partners (Davis et al., 2006) and to elicit more intimacy within the relationship (Davis et al., 2004). On the other hand, anxiously attached women might feel especially embarrassed in situations where they are comforted by their partners. Moreover, oral sex is more frequently received by men than women (Chambers, 2007). Although receiving attention might be the apparent goal of anxious individuals, this experience clearly contradicts their negative self-image (Shaver & Mikulincer, 2002), which might be embarrassing for them. Faking orgasm might be a strategy employed to overcome this embarrassment (Cooper et al., 2014).

Some general limitations of our study need to be acknowledged. First, our data relied solely on self-report and a convenience sample. Because the social representation of female orgasm is tightly linked to female sexual health and maturity (Colson, 2010), socially desirable responding might have distorted our results. Second, despite gathering information about participants' sexual orientation, our sample was not big enough to split with regard to sexual orientation. Although we believe that our results are predominantly characteristic of heterosexual women (78.7% of our participants), further research should test whether sexual orientation has a moderating effect on the relationship between dimensions of adult attachment and motivations for faking orgasm in women. Third, we did not collect all possible information regarding demographical data. Future research should pay more attention to detailed demographic data, and to orgasm frequency in women. Assessing orgasm frequency in the future could illuminate potential differences between those who choose to fake often/always and those who have faked only a few times. At present, it is unknown if such group differences exist and, if they do, women's corresponding motive(s) for faking orgasm and/or attachment style may further our understanding of these relationships.

Conclusion

This study builds on existing research in both attachment and the phenomenon of faking orgasm by furthering our understanding of the intersection between sexual behavior and interpersonal closeness. The findings not only point to important future research directions but can inform clinical work with women and couples. Psychologists, therapists, gynecologists, psychiatrists, and others can benefit from a deeper understanding of how attachment style influences sexual decision making. From a clinical standpoint, unsatisfactory sex in a relationship remains one of the biggest complaints among couples. Patients often present with serious and relationship-threatening concerns about their sexual frequency and quality, yet many individuals are unable to articulate the meaning that sex has for them. Compounding this issue, sex is often a difficult and embarrassing topic to discuss for both patients and their therapists or physicians. The results of this study can provide a framework for both providers and patients to begin processing and understanding the many difficult emotions that arise around sexual behavior in a relational context. Such a framework also serves to increase comfort with and competence in discussing sexual behavior for those working closely with women and couples.

For example, a woman with an anxious attachment style may report fears of her husband leaving her to her therapist. Having an understanding of the ways in which her attachment style may impact sexual decision making allows a provider to ask clinically informed and useful

questions to explore the consequences of these fears for the patient. Based on the results of this study, the therapist may ask and learn that the woman feels pressure to have sex with her husband nightly, despite a lack of desire. She may also report giving her partner frequent praise and faking orgasm when she is unable to experience an orgasm. In such a case, a therapist may choose to help the patient conceptualize faking orgasm with her husband as an emotion-regulating strategy, incorporated into a larger set of adaptive skills to help the patient tolerate and regulate difficult thoughts and feelings.

Armed with knowledge like that gained from this study, doctors and therapists can better help patients gain insight into their feelings and behaviors. This may help clinicians guide women to work within their attachment styles to maximize sexual pleasure and minimize psychological discomfort associated with sexual activity and orgasm. Without an accurate and informed understanding of sexual decision making, such as faking an orgasm or the frequency with which one chooses to have sex, providers are in danger of further pathologizing common sexual behaviors that may be serving an important psychological and relational function.

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4.3 Emotion Regulation Difficulties and Sexual Motivation Associated With Faking Orgasm Among Hungarian Women[15]

Norbert Meskó[1]*, Edit Csányi[1], Orsolya Inhóf[1], András N. Zsidó[1]

[1]Institute of Psychology, University of Pécs

*Corresponding author

Abstract

Objectives: Faking orgasm is a common yet psychologically complex behavior among women, shaped by both emotional vulnerabilities and sexual motivations. This study examined the psychological correlates of faking orgasm in two sexual contexts—vaginal intercourse and oral sex—focusing on difficulties in emotion regulation and sexual motivation.
Method: A sample of 425 Hungarian women completed self-report measures assessing six facets of emotion regulation (Difficulties in Emotion Regulation Scale), three types of sexual motivation (Hungarian Short Form of the Reasons for Having Sex Questionnaire), and four motives for faking orgasm in each context (Faking Orgasm Scale). We used a dual analytic approach combining network analysis and multiple linear regression to explore and predict context-specific patterns.
Results: Faking orgasm was associated with emotion regulation difficulties—especially non-acceptance of emotions, impulse control problems, and lack of emotional clarity—and with sexual motivations related to coping, personal goals, and partner-focused concerns. These associations were stronger and more interconnected in vaginal intercourse than in oral sex. Network centrality analyses identified coping-related motivation and emotion regulation deficits as key variables.
Conclusions: Faking orgasm may serve as a strategic emotion regulation behavior embedded in relational dynamics and sociocultural scripts. The findings highlight the importance of addressing emotional literacy, sexual communication, and relational expectations in clinical and educational contexts. Future research should investigate real-time affective processes and cultural norms that shape women's sexual behavior.

Keywords: Faking orgasm in women; Emotion regulation difficulties; Sexual motivation; Oral sex; Sexual intercourse; Coping mechanisms; Sexual decision-making

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1. Introduction

1.1 Understanding Female Orgasm and the Phenomenon of Faking

Female orgasm has been described as a multifaceted biopsychosocial phenomenon involving physiological, psychological, and relational processes that serve diverse functions in both sexual and relational contexts (Mah & Binik, 2002). Although orgasm contributes to women's sexual satisfaction, it is only one of several relevant factors, including emotional intimacy, sexual communication, and the relational context (Brody & Costa, 2009). Orgasms occur more frequently in committed relationships than in casual sexual encounters (Armstrong et al. 2012), suggesting that relational factors shape female orgasmic experiences. Qualitative research highlights factors that enhance women's ability to achieve orgasm, including strong interpersonal connections, participation in non-penetrative sexual activities, and positive body image (Fahs, 2014; Muehlenhard & Shippee, 2010).

Faking orgasm, explicitly documented by Masters and Johnson (1966), refers to deliberately imitating outward signs and sensations of sexual climax without experiencing the underlying physiological and psychological processes. Early research emphasized the relational and interpersonal dynamics underlying women's motivations for fake orgasms, highlighting how this behavior reflects broader relationship enhancement strategies (Darling & Davidson, 1986). Scholars have examined this phenomenon through frameworks such as evolutionary psychology, sociocultural paradigms, and interpersonal relationship dynamics (Cooper et al., 2014; Hevesi et al., 2022; Láng et al., 2020; McCoy et al., 2015). Faking orgasm occurs in various sexual contexts, including vaginal intercourse, oral sex, and other partnered sexual activities, and sexual motivations may differ across these contexts (Harris et al., 2016; Muehlenhard & Shippee, 2010). In line with Cooper's (2014) use of the term 'sexual intercourse' we refer to this behavior more precisely as 'vaginal intercourse' throughout this study.

It is crucial to distinguish between faking orgasm and orgasm difficulties. Orgasm difficulties refer to persistent challenges in reaching orgasm, while faking orgasm is a deliberate act serving psychological or relational functions independent of physiological capacity (Herbenick et al., 2019). This behavior, reported by a significant proportion of women, is associated with psychological and relational factors such as partner expectations and emotional regulation strategies (Muehlenhard & Shippee, 2010).

Understanding faking orgasm is essential because although it may serve adaptive functions such as avoiding conflict, preserving a partner's self-esteem, or maintaining harmony during sexual interactions (Wiederman, 1997; Herbenick et al., 2019), it can also indicate

underlying emotional or relational difficulties (Fahs, 2014; Thomas et al., 2017). The orgasmic response in women is a complex psychophysiological process that involves sensory, cognitive, and emotional components (Laan & Both, 2008). While orgasms are commonly linked to sexual pleasure and relational bonding, their absence, particularly in contexts with strong expectations or relational demands, may lead to dissatisfaction, distress, or relational tension (Basson, 2001; Brotto et al., 2016). These interpersonal and emotional layers of orgasmic experiences underscore the importance of examining faking orgasm as it offers insight into how individuals manage sexual communication, expectations, and intimacy.

1.2 The Role of Emotion Regulation Difficulties in Faking Orgasm

Difficulties in emotion regulation refer to impairments in identifying, understanding, managing, and responding adaptively to emotional states. According to Gratz and Roemer (2004), these difficulties can manifest as the non-acceptance of emotional responses, impulse control problems, and limited access to strategies that help achieve personal goals despite negative affect. Emotional dysregulation may, therefore, lead individuals to engage in behaviors that serve to manage emotional discomfort, including those occurring in intimate and sexual contexts (Aldao et al., 2010; Gross & John, 2003).

Surprisingly, despite the wide range of emotional experiences that may occur during sex, research examining the role of emotion regulation in normative sexual behavior remains limited. Most prior studies have focused on clinical or high-risk populations (e.g., Rellini et al., 2010; Noll et al., 2011), leaving a gap in understanding how emotion regulation processes influence common, non-pathological sexual behaviors, such as faking orgasm. Moura et al. (2020) have called attention to this gap, noting that everyday sexual functioning may also be shaped by underlying affective regulation strategies. In support of this, Mah and Binik (2001) suggested that women's sexual responses are closely tied to psychological adaptation, underscoring the interplay between emotional states and sexual outcomes.

On average, women report a broader range of sex-related emotional responses and are more likely to experience negative emotions such as fear, anxiety, or guilt during sexual activity, all of which have been associated with reduced sexual satisfaction and functioning (Dosch et al., 2016; Purdon & Holdaway, 2006; Mark & Murray, 2012). They may also attribute greater emotional or relational meaning to sexual encounters than to men, although this varies across individuals and contexts (Brom et al., 2015, 2016; Everaerd et al., 2006). Qualitative accounts suggest that, for some women, faking orgasm may function as an interpersonal strategy to avoid disappointing a partner, reduce relational tension, or end a dissatisfying encounter without confrontation (Cooper et al., 2014; Muehlenhard & Shippee, 2010).

Furthermore, recent studies have shown that difficulties in emotion regulation are associated with various aspects of sexual functioning and satisfaction, even outside clinical contexts (Fischer et al., 2023; Pepping et al., 2018; Viana-Sousa et al., 2023). These findings suggest that emotional dysregulation can play a role in shaping how individuals communicate and behave sexually, especially in situations where relational expectations are high or emotional needs conflict with sexual desires.

To date, only one study has explicitly investigated the link between emotion regulation and fake orgasm. Cooper (2014) found that women with more pronounced difficulties in emotion regulation, particularly in emotional clarity and acceptance, were more likely to report frequent faking of orgasm. These findings support the idea that faking orgasm can be understood as a regulatory strategy deployed under emotional strain, functioning to maintain a sense of control, avoid distress, or preserve harmony in a sexual relationship. This interpretation is consistent with earlier research indicating that women with orgasmic difficulties often report self-blame, emotional suppression, and heightened emotional dependency or worry (Rowland et al., 2018; Tavares et al., 2018).

Taken together, these results underscore the importance of examining how individual differences in emotion regulation contribute to the tendency to fake orgasm, particularly when sexual activity is emotionally or relationally complex. The present study aimed to investigate these links systematically using both network and regression analyses to explore the interplay between the dimensions of emotion regulation and orgasm-faking behaviors.

1.3 Sexual Motivation and the Strategic Use of Orgasm Faking

Sexual motivation refers to the internal drives, intentions, and desires that lead individuals to engage in sexual activities (Meston & Buss, 2007). These motivations are psychologically complex, and span a wide spectrum of reasons that extend beyond the pursuit of physical pleasure. While early research identified only a handful of sexual motives, subsequent studies have revealed that people engage in sex for a broad array of reasons, including emotional connections, reassurance, relational maintenance, curiosity, and even avoidance of conflict (Meston & Buss, 2007; Meskó et al., 2022).

Although gender differences in sexual motivation have been consistently documented, with women more frequently citing emotional or relational motives (e.g., love, intimacy, commitment) and men more often mentioning physical gratification or novelty, recent research emphasizes substantial individual variation and overlap across genders (Impett et al., 2005; Petersen & Hyde, 2010). Moreover, sexual motivation is not static; it evolves throughout the

lifespan and is influenced by hormonal, psychological, and relational factors (Klusmann, 2002; Toates, 2009).

One particularly relevant dimension of sexual motivation in the context of a faking orgasm is the use of sex as a form of emotional regulation. This coping-related sexual motivation reflects the tendency to engage in sexual behavior, not solely for pleasure or connection, but also as a means to manage internal emotional states or relational tension. For example, women may have sex to reduce anxiety, avoid relational conflict, or alleviate feelings of insecurity and fear of rejection (Cooper, 2014; Pham et al., 2015). In this context, sex can serve as a psychological coping strategy, rather than a purely hedonic or relational act.

Recent studies have empirically demonstrated a connection between coping-related sexual motivation and faking orgasm. In a cluster-analytic study, Cooper (2014) identified emotion regulation profiles associated with the frequency of and motivation for faking orgasm. Similarly, Csányi et al. (2024) found that coping-related motives significantly predicted faking orgasm across multiple contexts, including oral sex and vaginal intercourse. These findings suggest that, for many women, faking orgasm may be a behavioral manifestation of underlying affect regulation processes, serving to maintain emotional equilibrium or preserving relational stability under conditions of emotional discomfort.

Furthermore, sexual behavior is embedded in sociocultural norms and expectations. Sexual script theory posits that people internalize cultural narratives on how sexual interactions should unfold (Gagnon & Simon, 1973). Within many heteronormative contexts, women are often expected to prioritize their partners' satisfaction, avoid confrontation, and maintain harmony within the relationship. These expectations may encourage behaviors such as a faking orgasm, which functions as a strategic response to social pressure or interpersonal dynamics (Lehmiller, 2023; Meskó et al., 2022). In certain situations, orgasm itself may be commodified, with women simulating sexual climax as a means of meeting perceived relational obligations or avoiding difficult conversations (Frith, 2018; Thomas et al., 2017).

Taken together, these perspectives highlight that faking orgasm may be driven not only by situational demands but also by deeper emotional and motivational mechanisms. By integrating emotion regulation difficulties and coping-related sexual motives into a unified framework, researchers can better understand the complex psychological processes underlying this behavior. The present study aimed to explore these intertwined influences, with special attention paid to the distinct roles played by sexual context (vaginal intercourse vs. oral sex), emotional dysregulation, and motivational functions.

1.4 The Present Study

Building on prior research on the psychological mechanisms underlying faking orgasm, the present study aimed to examine how emotion regulation difficulties and sexual motivations contribute to this behavior in women. While previous studies have emphasized the interpersonal and affective functions of faking orgasm, few have systematically investigated the role of distinct emotion regulation deficits and coping-related sexual motives in a nonclinical context.

We focused on two core psychological domains: (1) emotion regulation difficulties, including non-acceptance of emotions, impulse control problems, and lack of emotional clarity; and (2) sexual motivations, with an emphasis on coping-related motives, that is, engaging in sex to manage negative emotions, reduce relational tension, or prevent rejection.

The behavioral outcome of interest, faking orgasm, was explored across two sexual contexts: oral sex and vaginal intercourse, following the structure of prior research (e.g., Cooper, 2014). This contextual distinction allowed us to examine whether emotional and motivational predictors operate differently across different types of sexual activities.

Given the limited number of studies examining these psychological variables in tandem, and the multivariate nature of their relationships, we employed an exploratory approach using both network analysis and multiple regression modeling.

Accordingly, we posed the following research question:

• RQ1: How are different facets of emotion regulation difficulties (e.g., non-acceptance of emotions, impulse control, and emotional clarity) associated with various motives for faking orgasm in women?

• RQ2: To what extent do emotion regulation difficulties and coping-related sexual motivations predict the tendency to fake orgasm during vaginal intercourse and oral sex?

Based on prior findings (Cooper, 2014; Csányi et al., 2024), we expected that faking orgasm would be most strongly associated with coping-related sexual motives and difficulties in non-acceptance of emotions, emotional clarity, and impulse control. We also anticipated that these associations might be more pronounced in the context of vaginal intercourse than in oral sex.

2. Hypotheses

Based on previous research, we formulate the following hypotheses:

H1: Difficulties in emotion regulation—particularly non-acceptance of emotions, impulse control problems, and lack of emotional clarity—are positively associated with the tendency to fake orgasm.

H2: Coping-related sexual motivation—particularly motives such as partner reassurance, emotional coping, and conflict avoidance—is positively associated with the tendency to fake orgasm, independent of other motivational dimensions (e.g., ego-focused or relationship-focused motives).

While this study did not aim to formally test interaction effects across sexual contexts, we anticipated that the strength of the associations between psychological predictors and orgasm faking might differ between vaginal intercourse and oral sex, with potentially stronger links emerging in the context of vaginal intercourse.

3. Method

3.1 Participants

This study was conducted in Hungary using a convenience sample of 425 self-identified women. All participants were assigned female at birth and identified as women. Their age ranged from 18 to 80 years (M = 24.51, SD = 7.74). All participants had previously engaged in sexual intercourse and 41 (9.6%) had at least one child.

The participants' relationship status varied at the time of the survey: 40.0% were dating, 29.6% cohabiting, 6.8% married, 5.6% engaged in casual sex with multiple partners, and 0.9% reported other arrangements (e.g., friends with benefits). Among them, 353 (83%) were in a sexual relationship at the time of data collection.

Sexual orientation was measured on a 7-point Likert scale ranging from exclusively heterosexual to exclusively homosexual; 85.2% of the respondents identified as exclusively heterosexual. Although the sex of sexual partners was not directly assessed, the orientation data suggested that most partnered sexual activity occurred with male partners.

Participants were asked to reflect on either their current or past relationship(s) in which they had faked an orgasm regardless of their current relationship status. This allowed for the inclusion of broader experiential data and captured retrospective insights into faking behavior. Prior research supports the utility of such retrospective accounts for understanding the relational and psychological dynamics in sexual behavior (Cooper, 2014; Cooper et al., 2016; Muehlenhard & Shippee, 2010).

Among the total sample, 151 women (35.5%) reported a faking orgasm during oral sex and 208 (48.9%) during vaginal intercourse. A total of 184 participants (43.3%) had faked orgasms in both contexts, whereas 123 (28.9%) reported that they had never done so. Participants who never faked orgasm (N = 123) were excluded from analyses where faking orgasm was the

dependent variable (e.g., regression) but were included in descriptive and correlational analyses.

3.2 Procedure

Participants were recruited online via social media platforms (e.g., Facebook and Instagram) and university mailing lists. The anonymous survey was administered using Qualtrics and took approximately 15–20 minutes to complete. Participation was voluntary and no compensation was offered.

To ensure adequate statistical power, the required sample size was determined using G*Power 3 (Faul et al., 2007) with f = 0.20, power = 0.95, and nine predictors, yielding a minimum of 127 participants. A larger sample size was targeted to ensure robustness in both the regression and network analyses. For the latter, sample sizes between 250 and 350 were generally sufficient to detect moderate sensitivity in edge weights for networks with up to 20 nodes (Constantin & Cramer, 2020).

Informed consent was obtained from all participants before they began the survey. This study was approved by the United Ethical Review Committee for Research in Psychology in Hungary (ref. No. 2022/107) and was not preregistered.

3.3 Measures

Before completing the questionnaires, the participants provided demographic information, including age, sex assigned at birth, gender identity, sexual orientation, and current relationship status. They were also asked whether they had ever experienced an orgasm during vaginal intercourse and/or when receiving oral sex. When responding to the Faking Orgasm Scale for Women (FOS; Cooper et al., 2014), participants were instructed to reflect on a current or past relationship in which they had faked orgasm, if applicable.

3.3.1 Faking Orgasm Scale for Women (FOS)

The FOS (Cooper et al., 2014; Hungarian adaptation: Csányi et al., 2024b) is a self-report instrument designed to assess motives for faking orgasm in two distinct sexual contexts: vaginal intercourse (35 items) and oral sex (26 items). Each context-specific set included four subscales capturing motivational dimensions such as enhancing a partner’s experience, avoiding negative consequences, emotion regulation, and reinforcing intimacy. This structure allows for a nuanced understanding of why women fake orgasms in different sexual contexts.

In the present study, the Oral Sex subscales were completed only by participants who reported having a faked orgasm while receiving oral sex (N = 151). The subscales evaluate several motives for faking orgasm: (1) Altruistic Deceit (OSAD (partner assurance during oral sex)), which involves simulating orgasm to protect a partner's feelings (e.g., Because you

believe it is important for your partner to feel they can please you); (2) Insecure Avoidance (OSIA (insecurity avoidance during oral sex)), where orgasm is faked to evade feelings of insecurity (e.g., because you feel physically uncomfortable during oral sex); (3) Elevated Arousal (OSEA (emotional avoidance during oral sex)), where the aim is to enhance one's own sexual arousal (e.g., To turn yourself on); and (4) Fear of Dysfunction (OSFD (fear of displeasing one's partner during oral sex)), which involves faking orgasm to address worries about being abnormal (e.g., because you suspect something might be physically wrong if you do not orgasm). The McDonald's ω values for the four measures were .93, .76, .83, and .83, respectively.

The Sexual Intercourse subscales were only completed by those participants who reported having faked orgasm during sexual intercourse (N = 208). The subscales evaluate the following motivations for faking orgasm: (1) Altruistic Deceit (SIAD (partner assurance during sexual intercourse)), where individuals pretend to climax to acknowledge their partner's efforts (e.g., Because you want to reward your partner for their effort); (2) Fear and Insecurity (SIFI (insecurity avoidance during sexual intercourse)), which involves faking orgasm to escape negative feelings related to the sexual experience (e.g., to avoid feeling badly about yourself if you do not have a real orgasm); (3) Elevated Arousal (SIEA (emotional avoidance during sexual intercourse)), where the intention is to boost one's own sexual excitement (e.g., to increase arousal during sexual intercourse); and (4) Sexual Adjournment (SISA (sexual anxiety during sexual intercourse)), where orgasm is faked to conclude sexual activity (e.g., because you want to go to sleep). The McDonald's ω values for the four measures were .94, .88, .93, and .80, respectively.

It is important to note that the Faking Orgasm Scale includes separate context-specific subscales for oral sex and vaginal intercourse, each with distinct items. Therefore, no direct statistical comparison was conducted between the two contexts as they represent conceptually and psychometrically distinct constructs.

3.3.2 Difficulties in Emotion Regulation Scale (DERS)

The DERS (Gratz & Roemer, 2004; Hungarian adaptation by Kökönyei et al., 2014) is a self-report scale consisting of 36 questions used to measure emotion dysregulation. The total score provides an overall measure of emotion regulation difficulties, while six specific difficulties are assessed by the following subscales: (1) Non-Acceptance of emotional responses (Non-Acceptance; 6 items; e.g., *When I'm upset, I feel guilty for feeling that way*); (2) Difficulties engaging in goal-directed behavior (Goals; 5 items; e.g., *When I'm upset, I have difficulty getting work done*); (3) Impulse control difficulties (Impulse; 6 items; e.g., *When I'm upset, I become out of control*), which measures difficulties in behavioral control and regulation when

experiencing (negative) emotions; (4) Lack of emotional awareness (Awareness; 6 items; e.g., *I pay attention to how I feel* [reverse-scored item]), which assesses one's tendency to ignore internal affective signals; (5) Limited access to emotion regulation strategies (Strategies; 8 items; *When I'm upset, I believe that there is nothing I can do to make myself feel better*); and (6) Lack of emotional clarity (Clarity; 5 items; *I am confused about how I feel*). Responses to each item are given on a 5-point rating scale ranging from *Almost Never* (1) to *Almost Always* (5). McDonald's ω values for the Non-Acceptance, Goals, Impulse, Awareness, Strategies, and Clarity subscales were .88, .91, .90, .79, .92, and .90, respectively.

3.3.3 Reasons for Having Sex Questionnaire, Hungarian Short Form (YSEX?-HSF)

The YSEX?-HSF, developed by Meskó et al. (2022), is a self-report tool designed to assess sexual motivation. The Hungarian version was based on the original American YSEX? questionnaire by Meston and Buss (2007) but consists of three main variables rather than four. Although these two questionnaires share similar items, their variable structures differ slightly, highlighting both universal and culturally specific aspects of human sexual motivation. The YSEX?-HSF consists of 73 items organized into three scales: (1) Personal Goal Attainment (e.g., I wanted a new experience), (2) Relational Reasons (e.g., I was in love), and (3) Sex as Coping (e.g., I wanted to save the relationship). Each item is rated on a 5-point scale, from 1 (none of my sexual experiences) to 5 (all of my sexual experiences), with higher scores indicating stronger motivation in each category. McDonald's ω values for personal goal attainment, relational reasoning, and sex as coping were .92, .90, and .91, respectively.

3.4 Statistical analyses

The primary aim of this study was to examine how psychological variables—emotion regulation difficulties and sexual motivations—predict the tendency to fake orgasm in two distinct sexual contexts: vaginal intercourse and oral sex. To address this, we used a combination of network analysis and multiple linear regression models following an exploratory-confirmatory analytic strategy.

First, we applied a network analysis to explore the partial correlations among the psychological predictors (that is, six DERS subscales and three YSEX?-HSF subscales), and Faking Orgasm Scale subscales. Two separate networks were estimated: one for vaginal intercourse (FOS-SI subscales), and one for oral sex (FOS-OS subscales). This approach allowed us to visualize the structure of associations and identify the central psychological variables within each sexual context.

The DERS subscales include non-acceptance of emotional responses, difficulties in goal-directed behavior, impulse control problems, lack of emotional awareness, limited access to

effective regulation strategies, and lack of emotional clarity. The three YSEX?-HSF subscales represented coping-related (coping with emotional distress), self-focused (personal goal attainment), and relationship-focused (partner-related relational goals) sexual motivations.

Network estimation was performed using the graphical Least Absolute Shrinkage and Selection Operator (glasso), with the extended Bayesian Information Criterion (EBIC) and a tuning parameter of 0.5 (Epskamp et al., 2018). Edge weights represent regularized partial correlations, and centrality indices (strength and expected influence) were computed to determine the most influential nodes. The stability of the network metrics was evaluated via nonparametric bootstrapping (1,000 iterations), and the correlation stability (CS) coefficient was used to assess reliability.

Next, to formally test our hypotheses (H1 and H2), we conducted multiple linear regression analyses. Separate models were estimated for each sexual context (oral sex and vaginal intercourse) with the self-reported frequency of faking orgasm as the dependent variable. This allowed us to assess the unique contribution of each predictor while controlling for the shared variance.

Power analysis indicated that a sample of at least 127 participants was needed (see Section 3.1 for details); our final sample of 425 exceeded this threshold, ensuring sufficient statistical power.

The assumptions of normality, linearity, homoscedasticity, and multicollinearity were tested. All variables showed acceptable skewness and kurtosis (between –2 and +2), and Variance Inflation Factor (VIF) values were below 4. Residuals were normally distributed, as confirmed by Kolmogorov–Smirnov tests (ps > .05) and visual Q–Q plot inspection.

Although no formal power analysis exists for psychological network analysis, sample adequacy was assessed via bootstrap-based precision and stability metrics following best-practice guidelines (Epskamp et al., 2018).

4. Results

4.1 Descriptive Statistics and Correlations

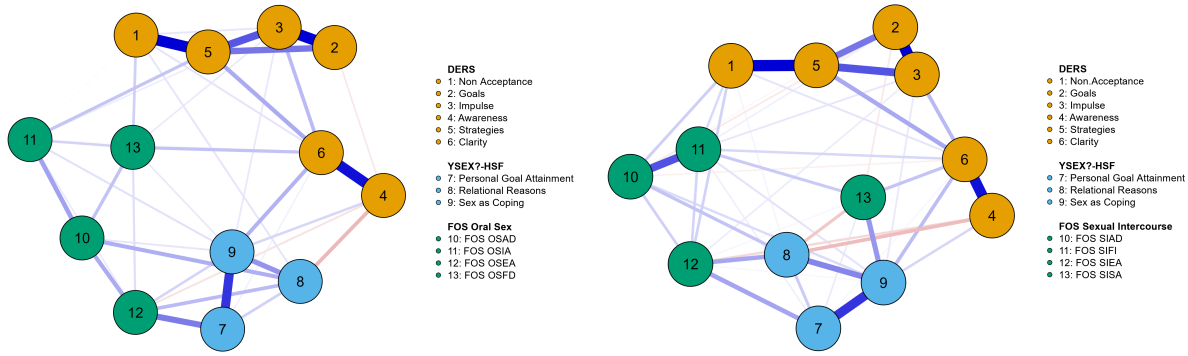
Descriptive statistics are presented in Table 1 and 2. Associations among variables were examined using network analysis, which estimates partial rather than zero-order correlations. As expected, the DERS subscales showed moderate to strong intercorrelations, particularly between impulse control difficulties and goal-directed behavior. The three sexual motivation subscales were also positively correlated, with the strongest association observed between coping-related motives and personal goal attainment. Faking orgasm subscales showed moderate

associations with both emotion regulation difficulties and sexual motivations, supporting their inclusion in the subsequent network and regression analyses.

4.2 Network Analysis

To explore the interrelations among psychological predictors and orgasm-faking tendencies, two network models were estimated: one for vaginal intercourse (FOS-SI subscales) and one for oral sex (FOS-OS subscales). Each model consisted of 13 nodes (six DERS subscales and three YSEX?-HSF subscales, and four FOS subscales). A fully connected network contains 78 edges; however, to obtain a parsimonious and interpretable structure, we applied the EBICglasso method with a tuning parameter of 0.5 (Epskamp et al., 2018). Figure 1 provides a graphical depiction of the two estimated networks, highlighting the partial correlations among emotion regulation difficulties, sexual motivations, and faking orgasm motives across contexts.

Figure 1. *The visualization of the network of the variables included in our study separately for FOS Oral Sex subscales (left panel) and FOS Sexual Intercourse subscales (right panel) variables. Blue lines represent positive associations, and red lines negative associations. The thickness of an edge indicates the association strength. Nodes with stronger or more connections are closer together and the most central nodes appear in the center.*



Note: OSAD = Oral Sex Altruistic Deceit; OSIA = Oral Sex Insecure Avoidance; OSEA = Oral Sex Elevated Arousal; OSFD = Oral Sex Fear of Dysfunction; SIAD = Sexual Intercourse Altruistic Deceit; SIFI = Sexual Intercourse Fear and Insecurity; SIEA = Sexual Intercourse Elevated Arousal; SISA = Sexual Intercourse Sexual Adjournment.

4.2.1 Oral Sex Context

The oral sex network (FOS-OS) resulted in 40 retained edges (see Table 1). As expected, the variables tended to cluster within instruments, but several cross-instrument associations emerged. Notably, the coping-related sexual motivation ("Sex as Coping") showed small-to-moderate positive associations with multiple orgasm-faking subscales. Among the emotion regulation variables, impulse control difficulties and lack of emotional clarity were modestly associated with faking orgasm, motivated by fear of dysfunction (OSFD) and insecurity avoidance (OSIA).

These findings suggest that while orgasm faking during oral sex is less embedded in emotion regulation difficulties than in vaginal intercourse, it still reflects the relevant affective and motivational processes. The overall pattern points to a looser and more situationally variable structure.

Table 1. *Edge weights matrix between the variables from the network analyses*

	FOS Oral Sex subscales												
Variable	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
1. DERS Non-Acceptance	0.000	0.000	0.045	0.000	0.456	0.048	0.000	0.047	0.000	0.000	0.003	0.000	0.084
2. DERS Goals	0.000	0.000	0.456	-0.040	0.245	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3. DERS Impulse	0.045	0.456	0.000	0.000	0.302	0.124	0.000	0.000	0.040	0.000	0.032	0.000	0.037
4. DERS Awareness	0.000	-0.040	0.000	0.000	0.000	0.429	0.000	-0.127	0.074	0.000	0.000	-0.049	0.000
5. DERS Strategies	0.456	0.245	0.302	0.000	0.000	0.150	0.000	0.000	0.000	0.000	0.104	0.000	0.000
6. DERS Clarity	0.048	0.000	0.124	0.429	0.150	0.000	0.025	0.000	0.136	0.000	0.006	0.000	0.108
7. YSEX?-HSF Personal Goal Attainment	0.000	0.000	0.000	0.000	0.000	0.025	0.000	0.082	0.363	0.000	0.000	0.234	0.000
8. YSEX?-HSF Relational Reasons	0.047	0.000	0.000	-0.127	0.000	0.000	0.082	0.000	0.192	0.144	0.000	0.124	0.000
9. YSEX?-HSF Sex as Coping	0.000	0.000	0.040	0.074	0.000	0.136	0.363	0.192	0.000	0.046	0.054	0.077	0.040
10. FOS OSAD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.144	0.046	0.000	0.166	0.151	0.109
11. FOS OSIA	0.003	0.000	0.032	0.000	0.104	0.006	0.000	0.000	0.054	0.166	0.000	0.036	0.078
12. FOS OSEA	0.000	0.000	0.000	-0.049	0.000	0.000	0.234	0.124	0.077	0.151	0.036	0.000	0.058
13. FOS OSFD	0.084	0.000	0.037	0.000	0.000	0.108	0.000	0.000	0.040	0.109	0.078	0.058	0.000

Note: DERS = Difficulties in Emotion Regulation. YSEX?-HSF = Hungarian Short Form if Reasons of Having Sex Questionnaire. FOS = Faking Orgasm Scale for Women. OSAD = Oral Sex Altruistic Deceit; OSIA = Oral Sex Insecure Avoidance; OSEA = Oral Sex Elevated Arousal; OSFD = Oral Sex Fear of Dysfunction.

4.2.2 Vaginal Intercourse Context

The vaginal intercourse network (FOS-SI) was denser, retaining 47 edges (see Table 2). Strong associations were observed between the DERS subscales (e.g., between difficulties in accessing regulation strategies and non-acceptance of emotions, or between impulse control problems and goal-directed behavior difficulties), reflecting well-known patterns of dysregulation.

Cross-instrument associations were more numerous and stronger than in the oral sex network. For example, faking orgasm due to partner reassurance (SIAD) was strongly linked to

sex as coping and non-acceptance of emotions. Similarly, emotional clarity difficulties were connected to sexual adjournment faking (SISA), whereas personal goal attainment and relational motives were associated with arousal enhancement faking (SIEA).

These results indicate that orgasm faking during vaginal intercourse is more closely tied to emotional dysregulation and motivational factors than is faking during oral sex.

Table 2. *Edge weights matrix between the variables from the network analyses*

	FOS Sexual Intercourse subscales												
Variable	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
1. DERS Non-Acceptance	0.000	0.000	0.036	0.000	0.460	0.048	0.000	0.020	0.000	0.088	0.069	0.082	0.000
2. DERS Goals	0.000	0.000	0.458	-0.042	0.248	0.000	0.000	0.000	0.000	-0.039	0.028	0.000	-0.039
3. DERS Impulse	0.036	0.458	0.000	0.000	0.308	0.126	0.000	0.000	0.039	0.000	0.043	0.035	0.000
4. DERS Awareness	0.000	-0.042	0.000	0.000	0.000	0.432	0.000	-0.121	0.073	0.000	0.000	-0.069	0.000
5. DERS Strategies	0.460	0.248	0.308	0.000	0.000	0.155	0.000	0.000	0.000	-0.015	0.000	0.000	0.000
6. DERS Clarity	0.048	0.000	0.126	0.432	0.155	0.000	0.015	0.000	0.119	-0.027	0.073	0.000	0.106
7. YSEX?-HSF Personal Goal Attainment	0.000	0.000	0.000	0.000	0.000	0.015	0.000	0.093	0.367	0.000	0.029	0.165	0.036
8. YSEX?-HSF Relational Reasons	0.020	0.000	0.000	-0.121	0.000	0.000	0.093	0.000	0.220	0.109	0.000	0.158	-0.100
9. YSEX?-HSF Sex as Coping	0.000	0.000	0.039	0.073	0.000	0.119	0.367	0.220	0.000	0.066	0.051	0.015	0.189
10. FOS SIAD	0.088	-0.039	0.000	0.000	-0.015	-0.027	0.000	0.109	0.066	0.000	0.314	0.084	0.000
11. FOS SIFI	0.069	0.028	0.043	0.000	0.000	0.073	0.029	0.000	0.051	0.314	0.000	0.078	0.096
12. FOS SIEA	0.082	0.000	0.035	-0.069	0.000	0.000	0.165	0.158	0.015	0.084	0.078	0.000	0.016
13. FOS SISA	0.000	-0.039	0.000	0.000	0.000	0.106	0.036	-0.100	0.189	0.000	0.096	0.016	0.000

Note: DERS = Difficulties in Emotion Regulation. YSEX?-HSF = Hungarian Short Form if Reasons of Having Sex Questionnaire. FOS = Faking Orgasm Scale for Women. SIAD = Sexual Intercourse Altruistic Deceit; SIFI = Sexual Intercourse Fear and Insecurity; SIEA = Sexual Intercourse Elevated Arousal; SISA = Sexual Intercourse Sexual Adjournment.

4.2.3 Centrality and Summary

Across both networks, 13 edges were observed between the FOS and DERS subscales, and 7 between the FOS and YSEX?-HSF subscales. Within-network associations were also

consistent with prior research, such as those between impulse control and goal-directed behavior (DERS) or between sex as coping and personal goal attainment (YSEX).

Centrality analyses (see Table 3) revealed that the most influential psychological predictors based on both strength and expected influence were impulse control difficulties, limited access to regulation strategies, lack of emotional clarity, and coping-related sexual motivation.

Taken together, network models support the idea that orgasm-faking behavior, particularly in the context of vaginal intercourse, is embedded within broader affective and motivational dynamics.

Table 3. *Centrality indices of the variables from the network analyses*

Variable	FOS Oral Sex subscales				FOS Sexual Intercourse subscales			
	Betweenness	Closeness	Strength	Expected influence	Betweenness	Closeness	Strength	Expected influence
1. DERS Non-Acceptance	-0.685	-0.121	-0.462	-0.138	0.496	0.324	-0.306	0.261
2. DERS Goals	-0.947	-1.002	-0.202	-0.213	-0.956	-1.312	-0.034	-0.354
3. DERS Impulse	-0.161	-0.118	1.089	1.120	0.012	-0.393	0.962	1.054
4. DERS Awareness	-0.161	0.951	-0.296	-1.544	-0.149	0.810	-0.647	-1.464
5. DERS Strategies	1.279	1.175	2.056	1.904	0.981	0.979	1.692	1.411
6. DERS Clarity	2.588	2.214	1.040	1.081	2.594	2.040	1.242	1.056
7. YSEX?-HSF Personal Goal Attainment	-0.161	-0.449	-0.367	-0.060	-0.633	-0.692	-0.812	-0.055
8. YSEX?-HSF Relational Reasons	-0.292	0.070	-0.314	-0.920	-0.472	0.340	-0.213	-1.116
9. YSEX?-HSF Sex as Coping	0.755	0.548	1.018	1.063	0.819	0.821	1.443	1.355
10. FOS OSAD/SIAD	-0.161	-0.275	-0.752	-0.373	-0.794	-0.803	-0.621	-0.463
11. FOS OSIA/SIFI	-0.423	-0.632	-1.353	-0.861	-0.633	-1.453	-0.422	0.189
12. FOS OSEA/SIEA	-0.685	-1.268	-0.261	-0.326	-0.633	-0.362	-0.830	-0.516
13. FOS OSFD/SISA	-0.947	-1.091	-1.196	-0.733	-0.633	-0.299	-1.455	-1.359

Note: DERS = Difficulties in Emotion Regulation. YSEX?-HSF = Hungarian Short Form if Reasons of Having Sex Questionnaire. FOS = Faking Orgasm Scale for Women. OSAD = Oral Sex Altruistic Deceit; OSIA = Oral Sex Insecure Avoidance; OSEA = Oral Sex Elevated Arousal; OSFD = Oral Sex Fear of Dysfunction; SIAD = Sexual Intercourse Altruistic Deceit; SIFI = Sexual Intercourse Fear and Insecurity; SIEA = Sexual Intercourse Elevated Arousal; SISA = Sexual Intercourse Sexual Adjournment.

4.3 Regression Analyses

To formally test our hypotheses (H1 and H2), we conducted multiple linear regression analyses using Generalized Linear Models (GLMs) with the self-reported frequency of faking orgasm as the dependent variable. Predictors included the emotion regulation and sexual motivation subscales described in the Methods section.

4.3.1 Oral Sex Context

The models for oral sex (FOS-OS) explained between 5.4% and 14% of the variance (see Table 4). Key findings:

• Partner assurance faking (OSAD) was positively predicted by relationship-focused sexual motivation.

• Insecurity avoidance faking (OSIA) was not significantly predicted by any individual variable, although the model was statistically significant.

• Elevated arousal faking (OSEA) was positively predicted by both personal goal attainment and relationship-focused motives.

• Dysfunction-avoidance faking (OSFD) was positively predicted by non-acceptance of emotions.

These results suggest that, while emotional and motivational factors play a role in faking orgasm during oral sex, the strength and consistency of these predictors are somewhat limited.

4.3.2 Vaginal Intercourse Context

The models for vaginal intercourse (FOS-SI) explained 11.5%–16.8% of the variance (see Table 4). Several robust patterns have emerged in this regard.

• Partner assurance faking (SIAD) was positively predicted by non-acceptance of emotions, relationship-focused motives, and coping-related sexual motivation.

• Insecurity avoidance faking (SIFI) model was statistically significant, although no single predictor emerged as significant.

• Elevated arousal faking (SIEA) was significantly predicted by non-acceptance of emotions, personal goal attainment, and relational motives.

• Sexual adjournment faking (SISA) was positively predicted by lack of emotional clarity and sex as coping, and negatively predicted by relational motives.

These findings support both hypotheses: Difficulties in emotion regulation and specific sexual motivations, particularly coping-related and partner-oriented motives, are reliable predictors of faking orgasm, especially during vaginal intercourse.

Table 4. *Results of the GLM analysis, the presented values are standardized estimates (β).*

		OSAD				OSIA			OSEA			OSFD		
		β/R^2	**df**	**t/F**	**p**	**β/R^2**	**t/F**	**p**	**β/R^2**	**t/F**	**p**	**β/R^2**	**t/F**	**p**
	Model	0.054	9, 141	1.95	0.050	0.066	2.17	0.028	0.140	3.70	< .001	0.093	2.70	0.006
DERS	**Non Acceptance**	0.017	141	0.15	0.88	0.090	0.82	0.41	0.061	0.57	0.56	*0.276*	*2.56*	*0.01*
	Goals	-0.054	141	-0.42	0.68	-0.017	-0.13	0.90	-0.068	-0.54	0.58	0.105	0.82	0.41
	Impulse	-0.030	141	-0.22	0.83	0.076	0.54	0.58	0.002	0.02	0.98	0.129	0.94	0.34

	Awareness	-0.090	141	-0.87	0.38	-0.126	-1.24	0.22	-0.179	-1.83	0.07	-0.020	-0.20	0.84
	Strategies	0.077	141	0.52	0.60	0.154	1.05	0.29	-0.009	-0.07	0.94	-0.268	-1.85	0.07
	Clarity	0.057	141	0.50	0.62	0.081	0.71	0.47	0.109	1.00	0.31	0.179	1.59	0.11
YSEX?-HSF	**Personal Goal Attainment**	-0.098	141	-1.03	0.31	-0.023	-0.24	0.81	*0.206*	*2.26*	*0.03*	-0.066	-0.71	0.48
	Relational Reasons	*0.262*	*141*	*2.76*	*0.01*	-0.075	-0.79	0.42	*0.178*	*1.98*	*0.05*	-0.059	-0.63	0.52
	Sex as Coping	0.150	141	1.47	0.14	0.163	1.61	0.11	0.121	1.25	0.21	0.172	1.72	0.09

		SIAD				**SIFI**			**SIEA**			**SISA**		
		β/R^2	**df**	**t/F**	**p**	**β/R^2**	**t/F**	**p**	**β/R^2**	**t/F**	**p**	**β/R^2**	**t/F**	**p**
	Model	0.115	9, 198	3.89	< .001	0.121	4.18	< .001	0.168	5.64	< .001	0.133	4.53	< .001
DERS	**Non Acceptance**	*0.344*	*198*	*3.67*	*< .001*	0.172	1.84	0.07	*0.226*	*2.48*	*0.01*	0.061	0.65	0.51
	Goals	-0.081	198	-0.81	0.42	0.067	0.67	0.50	0.022	0.22	0.82	-0.136	-1.36	0.17
	Impulse	0.089	198	0.78	0.43	0.081	0.70	0.48	0.195	1.75	0.08	0.067	0.59	0.55
	Awareness	0.083	198	0.98	0.32	-0.073	-0.86	0.38	-0.102	-1.23	0.22	-0.123	-1.45	0.15
	Strategies	-0.202	198	-1.72	0.09	-0.063	-0.53	0.59	-0.212	-1.85	0.07	-0.049	-0.42	0.67
	Clarity	-0.110	198	-1.18	0.24	0.153	1.64	0.10	-0.025	-0.27	0.78	*0.233*	*2.50*	*0.01*
YSEX?-HSF	**Personal Goal Attainment**	-0.067	198	-0.88	0.38	0.046	0.61	0.54	*0.151*	*2.02*	*0.04*	0.075	0.99	0.32
	Relational Reasons	*0.172*	*198*	*2.28*	*0.02*	0.026	0.34	0.73	*0.178*	*2.42*	*0.02*	*-0.237*	*-3.16*	*<.01*
	Sex as Coping	*0.182*	*198*	*2.19*	*0.03*	0.161	1.93	0.05	0.094	1.16	0.25	*0.306*	*3.71*	*< .001*

Note: DERS = Difficulties in Emotion Regulation. YSEX?-HSF = Hungarian Short Form if Reasons of Having Sex Questionnaire. FOS = Faking Orgasm Scale for Women. OSAD = Oral Sex Altruistic Deceit; OSIA = Oral Sex Insecure Avoidance; OSEA = Oral Sex Elevated Arousal; OSFD = Oral Sex Fear of Dysfunction; SIAD = Sexual Intercourse Altruistic Deceit; SIFI = Sexual Intercourse Fear and Insecurity; SIEA = Sexual Intercourse Elevated Arousal; SISA = Sexual Intercourse Sexual Adjournment.

4.4 Summary of Findings

The present study examined the psychological predictors of faking orgasm in two sexual contexts, oral sex and vaginal intercourse, using both network analysis and multiple regression. These findings provide converging evidence across the analytic strategies.

As hypothesized, difficulties in emotion regulation—particularly non-acceptance of emotions, impulse control problems, and lack of emotional clarity—were associated with increased tendencies to fake orgasm (H1). Similarly, coping-related, self-focused, and partner-oriented sexual motivations were positively related to faking orgasm, with coping-related motives emerging as particularly influential (H2).

Although both sexual contexts were associated with emotional and motivational factors, the patterns were more pronounced and consistent in vaginal intercourse. This suggests that a faking orgasm in this context may be more tightly embedded within broader affective and relational dynamics.

Together, these results support a multidimensional understanding of faking orgasm, in which emotional dysregulation and strategic sexual motivation interact to shape women's sexual behavior across contexts.

5. Discussion

This study investigated the psychological underpinnings of faking orgasm by simultaneously examining emotion regulation difficulties and sexual motivations across two sexual contexts: oral sex and vaginal intercourse. Using both network analysis and multiple regression, the findings highlighted that orgasm-faking behaviors are significantly associated with specific emotion regulation deficits (e.g., non-acceptance of emotions and emotional clarity) and strategic sexual motives, particularly coping-related reasons. These results extend prior research by integrating two often-separately studied domains—emotional functioning and sexual motivation—into a unified framework.

In what follows, we first discuss the theoretical implications of our findings in light of the existing literature on emotion regulation and sexual behavior. We then considered the differences between the sexual contexts and their possible interpretations. Finally, we reflect on the methodological limitations of our study and outline the directions for future research.

5.1 Theoretical Implications

The present findings deepen our understanding of how difficulties in emotion regulation and sexual motivations intersect in shaping women's orgasm-faking behavior. Consistent with Cooper's (2014) cluster analysis findings, our results support the notion that faking orgasm may serve affect-regulatory purposes, particularly when women face emotional discomfort or relational demands. Specifically, difficulties in the non-acceptance of emotions, impulse control, and emotional clarity emerged as the core emotional traits associated with orgasm-faking, suggesting that faking may function as a compensatory strategy in emotionally charged sexual encounters.

These results align with prior work on affective regulation in sexual behavior, which has shown that women often engage in sex not solely for physical pleasure but also to manage negative emotional states (Impett et al., 2005; Bőthe et al., 2020). Meston and Buss (2007) emphasized the psychological complexity of sexual motivations, highlighting that many individuals pursue sex to meet psychological or relational needs. Our findings extend this by showing that when these motives—particularly coping-related ones—are paired with emotional dysregulation, they may lead to strategic sexual behaviors, such as faking orgasm.

The association between coping-related motives and faking orgasm resonates with theories that frame sexual behavior as embedded in sociocultural scripts and expectations (Frith, 2018; Lehmiller, 2023). For women, these scripts often prioritize partner satisfaction and relational harmony, potentially reinforcing the tendency to simulate orgasm when emotional or relational pressure is high (Thomas et al., 2017). This strategic accommodation can be seen as a form of avoidant coping, helping women manage emotionally uncomfortable or ambivalent sexual experiences (Jonason, 2019).

Notably, our results echo earlier findings linking shame, self-blame, and negative body image to reduced orgasmic functioning and increased faking (Nobre & Pinto-Gouveia, 2008; Rowland et al., 2018; Tavares et al., 2018). Taken together, these patterns suggest that faking orgasm is not merely a relational tactic but may reflect a deeper emotional regulatory mechanism that is shaped by individual vulnerabilities and broader sociocultural expectations.

This interpretation is further supported by our network analysis, which identified high centrality for both coping-related sexual motivation and difficulties in emotion regulation. These findings contribute to a growing body of research suggesting that sexual behavior, particularly in women, cannot be fully understood without accounting for the emotional and motivational dynamics that underlie it. These results also resonate with the sexual script theory, which posits that sexual behavior is guided by culturally shared narratives that prescribe appropriate roles, goals, and outcomes for each gender (Frith & Kitzinger, 2001; Simon & Gagnon, 1986). In this view, faking orgasm can be understood as an enactment of normative scripts that emphasize female responsibility for male satisfaction, reinforcing expectations around performance and relational harmony.

5.2 Sexual Contexts: Oral vs. Vaginal Intercourse

The present study differentiated between two sexual contexts, oral sex and vaginal intercourse, to explore whether psychological predictors of orgasm faking operate similarly across situations. This distinction, originally emphasized by Cooper (2014), proved to be theoretically and empirically meaningful. Although both contexts showed associations between faking orgasm and psychological variables, the patterns differed in strength and specificity.

Faking an orgasm during vaginal intercourse was more consistently and strongly associated with emotion regulation difficulties and coping-related sexual motivations. This finding suggests that vaginal intercourse may be a more emotionally and relationally loaded context for many women, where the stakes of sexual performance and partner satisfaction are perceived to be higher. Such interpretations are consistent with sexual script theory, which posits that heterosexual intercourse carries culturally embedded expectations—particularly for women—to

engage in “successful” sex that includes a visible orgasmic response (Frith, 2018; Lehmiller, 2023). Faking an orgasm in this context may thus serve as a socially scripted behavior to meet perceived relational obligations and avoid disrupting partner dynamics (Thomas et al., 2017).

In contrast, faking orgasm during oral sex is less tightly embedded in broader emotional and motivational profiles. Although meaningful associations were still found, especially with coping-related motives and the non-acceptance of emotions, the overall structure was sparser. This may reflect the lower normative pressure associated with orgasm during oral sex as well as differing levels of partner involvement or expectations (Herbenick et al., 2010). Prior research has also shown that women are more likely to achieve orgasm during oral sex than during intercourse (Armstrong et al., 2012), possibly reducing their need or motivation to fake.

These context-specific findings highlight the importance of distinguishing sexual behaviors not only by type but also by their emotional and relational embeddings. The results suggest that faking orgasm may serve different functions across contexts, more as a strategic affective regulation mechanism in vaginal intercourse and potentially more situational or performance-oriented during oral sex. Future research should explore how emotional and motivational dynamics vary across sexual acts, partner types, and relational settings.

These patterns may also reflect the influence of heteronormative models, which frame heterosexual intercourse as prototypical or idealized sexual activity (Jackson, 2006). In such models, women may feel pressured to conform to the expectation of orgasm during vaginal intercourse, even when the experience is not pleasurable or emotionally attuned, leading to strategic behaviors, such as faking orgasm to maintain normative appearances.

5.3 Clinical and Social Relevance

These findings have important implications for both clinical practice and the public discourse on female sexuality. Understanding faking orgasm as a possible indicator of emotion regulation difficulties and affect-driven sexual motivation may assist therapists in identifying the maladaptive coping strategies that manifest in sexual contexts. For example, clinicians working with women reporting low sexual satisfaction or sexual communication difficulties may consider exploring the emotional and motivational underpinnings of orgasm-faking as part of a broader affective and relational assessment.

Coping-related sexual motivations, such as having sex to reduce anxiety, avoid conflict, or maintain emotional closeness, may not always be consciously acknowledged by clients. Yet, as this study suggests, these motivations can interact with emotional dysregulation to foster strategic sexual behaviors, such as faking orgasm, which may initially preserve relational harmony but ultimately perpetuate sexual dissatisfaction or emotional disconnection. Recognizing

these patterns may support more nuanced therapeutic work, especially in couples and sex therapy settings.

On a broader level, these results highlight the role of cultural narratives and social expectations in shaping women's sexual behaviors. When women internalize norms that prioritize their partners' satisfaction or emotional stability over their own authenticity or pleasure, they may feel compelled to simulate orgasms as a means of meeting those expectations. Educational efforts that normalize a diversity of orgasmic experiences and promote open sexual communication could help reduce the perceived need for fake orgasm and foster healthier sexual dynamics.

The identification of key emotional traits, such as impulse control difficulties, limited access to emotion regulation strategies, and poor emotional clarity, as central predictors of faking behavior also underscores the need for more integrated psychological approaches to sexuality. Emotional literacy, mindfulness-based interventions, and emotion-focused therapy techniques may be useful in helping individuals improve their emotional regulation capacities and develop more satisfying sexual relationships.

In sum, these findings support a growing view of sexuality as deeply intertwined with psychological and emotional functioning and suggest that faking orgasm can serve as a behavioral lens through which deeper emotional needs, vulnerabilities, or unspoken relational scripts are expressed.

5.4 Limitations and Future Directions

Although this study provides novel insights into the psychological underpinnings of faking orgasm, several limitations must be acknowledged. First, its cross-sectional and correlational design precludes causal inferences. Although the network analysis revealed meaningful associations and centrality patterns, it could not determine the directionality of the effects. Future research using longitudinal or experimental designs is needed to clarify how emotion regulation and sexual motivation dynamically influence orgasm-faking behavior over time or across relational transitions.

Second, the use of self-report measures may have introduced biases related to social desirability, memory recall, or limited introspective access, particularly in relation to sexual motivation and affective regulation. While retrospective self-reports can meaningfully capture aspects of sexual behavior (Cooper, 2014; Muehlenhard & Shippee, 2010), they may not fully convey the lived emotional nuances involved in orgasm-faking. Although a growing number of qualitative studies have examined women's experiences of faking orgasm, few have directly explored this behavior in relation to emotion regulation difficulties and coping-related sexual

motives, which are central to the present study. Future qualitative work focused specifically on these psychological dimensions could offer richer insights into the affective functions of orgasm-faking in everyday sexual contexts.

Third, although our study focused on the frequency of and motivations for faking orgasm, we did not assess whether participants were generally able to achieve orgasm. Since faking orgasm is conceptually distinct from orgasmic difficulty, the absence of a measure assessing orgasmic functioning limits our ability to contextualize the motivations behind faking. Future studies should include direct assessments of orgasm frequency and consistency to better distinguish between strategic faking and compensatory responses to sexual dysfunction.

Fourth, although we assessed six facets of emotion regulation and three sexual motivation dimensions, other potentially relevant psychological constructs, such as attachment style, self-esteem, shame, and sexual assertiveness, were not included. Integrating these variables in future models could enhance explanatory power and contribute to a more comprehensive understanding of why and when women fake orgasms.

Fifth, the sample was limited to self-identified women who were recruited through convenience sampling in Hungary. The predominance of young heterosexual participants may limit the generalizability of the findings to more diverse populations. Cultural norms around sexuality and emotional expression may shape both the likelihood and meaning of orgasm faking; therefore, cross-cultural and LGBTQ+-inclusive studies are urgently needed.

Sixth, although we collected basic demographic data (age, relationship status, and sexual orientation), we did not include these variables as covariates in the main analysis. This decision was informed by our study's focus on psychological predictors, and preliminary analyses indicated that these demographic factors were not significantly associated with outcome variables. However, we acknowledge that such variables may still interact with emotional and motivational patterns in more complex ways, particularly in light of heteronormative social scripts that shape sexual expectations and behaviors. The omission of these covariates limits the depth of interpretation and may obscure important subgroup differences. Future studies should explicitly examine the moderating role of demographic and relational variables in shaping orgasm-faking tendencies, and consider their inclusion in predictive models.

Although our sample included a notable proportion of participants who did not identify themselves as exclusively heterosexual, we did not conduct subgroup analyses based on sexual orientation. This decision reflects both the study's primary focus on psychological predictors and the need to maintain a clear and coherent analytical framework. Including sexual orientation as an additional explanatory variable would have required a distinct conceptual and

methodological designideally supported by a dedicated sample and instruments tailored to the experiences of sexual minority groups. Nevertheless, we acknowledge that valuable insights could be gained by exploring how sexual orientation intersects with emotional and motivational dynamics in orgasm-faking behavior. Future studies should pursue this direction to better understand how sexual identity shapes the affective and strategic dimensions of sexual functioning.

Finally, our use of "vaginal intercourse" and "oral sex" as context categories followed prior literature (Cooper, 2014), but additional contextual distinctions, such as sexual initiation, partner type, and relational satisfaction, may offer further nuance. Future research should aim to disentangle these layers and examine how they interact with the emotional and motivational patterns.

Despite these limitations, this study contributes to a growing body of research highlighting the psychological complexity of women's sexual behaviors. By foregrounding the roles of emotion regulation and coping-related sexual motives, our findings open new avenues for both theoretical refinement and applied interventions in clinical and educational settings.

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Ethical approval

Ethics approval was obtained from the Hungarian United Ethical Review Committee for Research in Psychology.

Informed consent

Informed consent was obtained from all individual participants included in the study.

Data Availability Statement

The data that support the findings of this study are available at: https://osf.io/eyrwd/?view_only=b0d36d6df9fa4bdfa9c2d6883b5dfeaf.

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Competing Interests

The authors have no relevant financial or non-financial interests to disclose.

Conflict of Interest

Authors declare that they have no conflict of interest.

Author Contributions

Author 1: Conceptualization, Data Collection, Writing—Original draft preparation, Funding acquisition, Supervision; Author 2: Methodology, Writing—Reviewing and Editing;

Author 3: Data curation, Formal analyses; Author 4: Data curation, Formal analyses, Visualization. All authors read and approved the final manuscript.

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4.4 Mate Retention Is a Stronger Predictor of Faking Orgasm Than Sociosexuality and Relationship Satisfaction Among Hungarian Women[16]

Norbert Meskó[1]*, Edit Csányi[1], András N. Zsidó[1]

[1]Institute of Psychology, University of Pécs

*Corresponding author

Abstract

Previous research has established a positive association between women's faking orgasm and various relationship dynamics, including increased mate-retention behaviors, unrestricted sociosexuality, and lower relationship satisfaction. However, these associations have not been extensively examined in non-Western contexts. This study aims to explore whether these relationships hold among Hungarian women, contributing to a broader understanding of the role of faking orgasm in romantic relationships. A total of 449 Hungarian women (M_age = 33.95 years, SD = 10.14) participated in an online survey. Participants completed self-report measures that assessed their frequency of faking orgasm, mate-retention behaviors, sociosexual orientation, and relationship satisfaction. The Faking Orgasm Scale (FOS) was used to measure the tendency to fake orgasms, whereas the Mate Retention Inventory (MRI) assessed engagement in mate-retention strategies. Sociosexual orientation was measured using the Revised Sociosexual Orientation Inventory (SOI-R), and relationship satisfaction was assessed using the Hungarian version of the Relationship Assessment Scale (RAS-H). To test the hypothesized associations, binomial regression analyses and Structural Equation Modeling (SEM) were applied. The analyses revealed that unrestricted sociosexuality was negatively associated with relationship satisfaction and positively associated with mate-retention behavior. Mate-retention behavior, in turn, positively predicted faking orgasm during sexual intercourse. However, a different pattern emerged in the context of receiving oral sex. Unrestricted sociosexuality negatively predicted relationship satisfaction. Relationship satisfaction positively predicted mate-retention behavior and negatively predicted faking orgasm during oral sex. Finally, mate-retention behavior positively predicted faking orgasm during oral sex. These findings align with previous research conducted in American and Brazilian samples, suggesting that women may fake orgasms as part of a broader mate-retention strategy. Faking orgasm may serve to enhance both partners' sexual and emotional experiences, potentially reinforcing the male partner's emotional investment in the relationship. The observed differences between sexual intercourse and oral sex highlight the complexity of this behavior, indicating that the motivational underpinnings of faking orgasm may vary depending on the specific sexual context. This study provides cross-cultural evidence that faking orgasm is linked to mate-retention behaviors and relationship satisfaction dynamics, supporting the view that this behavior may serve a relational function. These results contribute to a broader understanding of female sexual behaviors in romantic relationships, emphasizing the need for further research to explore underlying motivations and potential cultural variations.

Keywords: faking orgasm, sociosexuality, mate retention, relationship satisfaction, Hungarian women, structural equation modeling.

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1. Theoretical Background

1.1. Biopsychosocial Perspectives on Female Orgasm

The climax of sexual intercourse is orgasm (Masters & Johnson, 1966), which is accompanied by various behavioral responses and physiological processes due to the release of oxytocin (Meston et al., 2004). These include increased heart rate, intense breathing, elevated blood pressure, and involuntary rhythmic muscle contractions in the vagina, uterus, and fallopian tubes (Komisaruk et al., 2006). Additionally, cortical activity decreases while activity in the dopamine system increases, which is associated with reduced cognitive function and an intense feeling of pleasure (Georgiadis et al., 2009). Experiencing an orgasm without mechanical stimulation is rare; however, its effects have been observed in physiological, psychosomatic, and psychosexual processes (Welling, 2014). As difficulties in achieving an orgasm are, in part, independent of anatomical characteristics, the feeling of satisfaction provided by the orgasm cannot be considered biological. Rather, psychological processes may induce the desire for post-orgasmic satisfaction (Meston et al. 2004). The experience of orgasm shows a high degree of individual variation; for some, it plays a very important role in their lives, whereas for others, it is less significant (Bancroft, 2008). Today, women's sexual satisfaction is not only important for women. Mark (2014) found that during sexual intercourse, men aim to bring pleasure to their partners, in addition to seeking their own satisfaction. Female sexual satisfaction can maintain and enhance emotional bonding and intimacy between partners, increase overall satisfaction, and as a result, increase relationship satisfaction, which may reduce the likelihood of separation in the long term (Welling, 2014). However, women who are unable to experience orgasm report feelings of frustration and lack of fulfillment, and the tension resulting from dissatisfaction can affect various aspects of cohabitation (Meston, 2004). In the presence of anorgasmia—that is, when a woman is unable to reach orgasm in a specific sexual encounter—men may feel negatively evaluated by their partner, often interpreting this as a reflection of their sexual performance or desirability (Salisbury & Fisher, 2014). This perception may lead to self-doubt or insecurity, particularly when the inability to induce an orgasm is attributed to their actions or inadequacy as a lover. Thus, while orgasm and satisfaction are conceptually distinct, difficulties in reaching orgasm, especially when attributed to the partner, may foster both individual frustration and relational dissatisfaction.

1.2. Motivations and Dynamics of Faking Orgasm

Fake orgasm is defined as faking to have (while not actually experiencing) an orgasm using muscle contractions and/or vocal expressions (Cooper et al., 2014). As male orgasm is

accompanied by ejaculation, it is much harder or even impossible for men to fake an orgasm (Braun et al., 2003). This may explain why research has predominantly focused on simulating female orgasm. In one study, approximately 60% of women reported having faked an orgasm (Muehlenhard & Shippee, 2010), which may be explained by their difficulties in achieving an orgasm (Barnett et al., 2019). Another study found that 34.7% of women rarely or never experienced an orgasm during intercourse (Dawood et al., 2005). Moreover, even in the context of receiving oral sex, a sexual activity more strongly associated with female orgasm, only 32% reported consistently reaching orgasm (Vannier & O'Sullivan, 2012). Women most frequently fake orgasms during intercourse without clitoral stimulation and least frequently when intercourse is coupled with clitoral stimulation (Bryan, 2001).

Bryan (2001) categorized the reasons for faking orgasm during sexual intercourse and while receiving oral sex into three main groups: internal reasons, contextual reasons, and relationship-related reasons. Internal reasons refer to psychological processes such as feelings and emotional states, and faking orgasm for this reason is often aimed at increasing sexual arousal. Thirty-three percent of those who faked their orgasm reported that it helped to increase low sexual arousal. Internal reasons include avoiding negative feelings (Muehlenhard & Shippee, 2010), internal insecurities, desire to manipulate a partner (McCoy et al., 2015), and feelings of shame and guilt (Lentz & Zaikman, 2020). These emotional processes are further supported by qualitative findings indicating that some women feel guilty yet perceive faking as necessary to meet expectations or preserve harmony (Howes, 2019). Contextual reasons include boredom, fatigue, and desire to end sexual contact as quickly as possible. Seventy-one percent of women faked their orgasm when they thought it would take too long or would be impossible to reach a climax (Muehlenhard & Shippee, 2010). These reasons can generally be considered as ways to escape uncomfortable sexual situations that involve unpleasant feelings.

Empirical evidence supports the view that orgasmic difficulties and the type of sexual relationship are both associated with faking orgasm. In a Hungarian sample, w et al. (2021) found that women experiencing orgasmic problems were more likely to report faking orgasm, especially in long-term relationships, suggesting that sexual dysfunction and relational dynamics jointly influence this behavior. Relationship-related reasons are linked to the quality and stability of the relationship and feelings towards the partner. Since simulating orgasm is ultimately a relational phenomenon—that is, it has no purpose without the presence of a partner—it is associated with various relationship processes, such as relational and sexual satisfaction, love, commitment, and partner retention. Ninety percent of men in relationships are concerned about whether their female partner has experienced an orgasm (McKibbin et al., 2010).

Muehlenhard and Shippee (2010) reported that 70% of women faked orgasm to avoid hurting their partner's feelings, please them, and bring them some form of joy. Cooper et al. (2014) confirmed that women's reasons for faking orgasm are very similar, albeit not identical, during sexual intercourse and while receiving oral sex. Recent research has also begun to explore why some women decide to stop faking orgasm. In a large cross-national study involving over 12,000 women from Denmark, Finland, France, Norway, Sweden, and the UK, Pavan et al. (2024) found that discontinuing the behavior was often associated with improved sexual communication and greater self-acceptance. These findings highlight that faking orgasm is not necessarily a static or fixed behavior, but one that can evolve alongside relational growth and personal development. Such insights underscore the importance of considering not only why women fake orgasm, but also the conditions under which they may choose to stop.

1.3. The Role of Sociosexuality in Female Orgasm and Relationship Dynamics

The ability of women to experience orgasm depends not only on their individual characteristics, but also on interpersonal factors, such as the context of the relationship in which sexual contact occurs (Wongsomboon et al., 2020). In general, women are more likely to experience orgasm and be satisfied with their sex life in emotionally committed, stable, long-term relationships, as compared to casual relation-ships or "friends with benefits" relationships (Birnie-Porter & Hunt, 2015). Wongsomboon et al. (2020) concluded that unrestricted sociosexuality (openness to casual sex) is positively associated with achievement of orgasm among women participating in casual sexual relationships. However, this was not the case for women with restricted sociosexuality (committed relationships). Therefore, unrestricted sociosexuality was positively related to sexual satisfaction only among those involved in causal relationships. In other words, those who prefer casual sexual encounters are positively stimulated by the circumstances of such encounters, which increases their likelihood of satisfaction. According to Jonason (2019), individuals interested in causal relationships are more likely to prioritize their own sexual pleasure. In some cases, they may fake an orgasm not to please the partner but to bring the encounter to a faster close or to maintain a certain self-image. This form of deception may help them feel more in control or avoid awkwardness, indirectly contributing to a satisfying overall experience. By contrast, individuals in long-term romantic relationships are emotionally committed to their partners and are thus motivated to encourage them through positive reinforcement rather than to deceive them.

1.4. Evolutionary Insights into Female Orgasm and Mate Retention

Throughout human evolution, long-term partnerships have provided critical reproductive and survival advantages for both sexes. For men, these partnerships increased paternity

certainty, whereas for women, they ensured consistent access to resources and protection for themselves and their offspring (Buss & Schmitt, 1993, 2019; Gallup & Frederick, 2010; Trivers, 1972). However, infidelity imposes significant costs: men risk investing in unrelated offspring if their partners are sexually unfaithful, whereas women suffer from emotional detachment and potential loss of investment if their partners engage in emotional infidelity (Buss & Shackelford, 1997; Buss, 2016). These pressures have likely driven the evolution of psychological mechanisms such as mate retention behaviors designed to minimize infidelity risks and secure relationship stability (Buss, 1988).

Mate retention behaviors can be broadly categorized as cost-inflicting strategies, which impose costs on the partner (e.g., inducing guilt), and benefit-provisioning strategies, which enhance partner satisfaction and intimacy (e.g., ensuring physical attractiveness; Miner et al., 2009). While the theoretical distinction between cost-inflicting and benefit-provisioning strategies is widely cited, empirical research has also supported a robust two-factor structure of mate retention behaviors, comprising intersexual and intrasexual manipulation tactics (Buss et al., 2008). This structure has been replicated in culturally distinct populations such as Brazilian women, where it has demonstrated acceptable psychometric properties (Biermann et al., 2021). In this study, we adopted this two-factor model for the Mate Retention Inventory–Short Form (MRI–SF) because of its conceptual clarity and suitability for statistical modeling. Although this structure has not yet been validated in a Hungarian sample, its cross-cultural robustness supports its application. Such behaviors aim to address the challenges of maintaining long-term relationships, which often require adapting to changes and resolving conflicts, with infidelity being a particularly significant source of tension (Shackelford et al., 2005). The subjective probability of partner infidelity is positively associated with the frequency of mate retention behaviors (Buss & Shackelford, 1997). For women, efforts to express sexual satisfaction may function as a form of retention behavior, as female sexual satisfaction is linked to emotional closeness, male satisfaction, and a reduced likelihood of infidelity or relationship abandonment (Kaighobadi et al., 2012; Welling, 2014). Some women may fake orgasm not only to please their partners but also to convey a sense of sexual satisfaction, even if they do not experience it.

Faking orgasm is a less-studied behavior that is potentially linked to mate retention. Female orgasm is a complex phenomenon involving physiological, psychological, and relational dimensions, with experiences varying widely among individuals. While orgasm contributes to sexual and relationship satisfaction, difficulties in achieving orgasm can lead to frustration and dissatisfaction (Meston, 2004; Petersen & Hyde, 2010). Men place significant value on their

partners' sexual satisfaction, as indicated by their concerns about their partners' abilities to achieve an orgasm (McKibbin et al., 2010; Salisbury & Fisher, 2014). Consequently, women may simulate orgasm as a strategic act to maintain harmony, reinforce emotional bonds, or secure their partners' commitment (McCoy et al., 2015; Muehlenhard & Shippee, 2010).

The strategic relevance of faking orgasm has received increasing attention in evolutionary research. For instance, Kaighobadi et al. (2012) found that women who perceived a higher risk of partner infidelity were more likely to report faking orgasm, which was associated with more frequent engagement in cost-inflicting mate-retention behaviors. This behavior may function as a false mating signal, which could be associated with reinforcing the male partner's commitment and a lower likelihood of infidelity. Additionally, women's vocalizations during simulated orgasm may provide opportunities to manipulate their partners' sexual behavior (Muehlenhard & Shippee, 2010).

While faking an orgasm may serve an adaptive purpose, its implications on relationship satisfaction are nuanced. Positive motivations such as love and desire to enhance mutual satisfaction are associated with stronger relationships (Séguin et al., 2015). However, negative motivations, such as insecurity or fear of abandonment can undermine sexual and relational well-being (Biermann et al., 2021). Mate retention behaviors also vary in their impact: benefit-provisioning strategies tend to enhance satisfaction, whereas manipulative or monopolizing behaviors may decrease satisfaction (Shackelford et al., 2005).

Theoretically, faking orgasm can be conceptualized in two distinct ways. On the one hand, it may function as a specific mate-retention strategy employed to prevent a partner's infidelity or emotional defection, especially under conditions of perceived relationship threat (Kaighobadi et al., 2012). From this perspective, faking orgasm is not merely deceptive but serves as an adaptive signal intended to reinforce the partner's commitment. On the other hand, faking orgasm may represent a relational behavior that co-occurs with mate-retention efforts but is not a distinct strategy in itself. For example, it may emerge from broader interpersonal dynamics such as sexual performance anxiety, relationship insecurity, or cultural expectations regarding female sexual responsiveness. Biermann et al. (2021) emphasize that some motivations—such as pleasing the partner or avoiding conflict—may align with benefit-provisioning behaviors, while others reflect manipulative or avoidant strategies. Our study adopts the former perspective, viewing faking orgasm as a potentially intentional behavior that may contribute to mate retention, while also acknowledging that individual motivations and relational contexts may shape its function in nuanced ways.

Cultural context plays an important role in understanding these dynamics. While previous research has extensively examined the associations among faking orgasm, sociosexuality, relationship satisfaction, and mate retention behaviors in populations predominantly from North America, the generalizability of these findings to other cultural contexts remains underexplored (Biermann et al., 2021; Kaighobadi et al., 2012; McCoy et al., 2015). Cross-cultural variations in sociosexual norms, relationship dynamics, and gender roles can influence the prevalence, motivations, and outcomes of behaviors such as faking orgasm. Hungary, as a Central European nation, provides a distinct cultural context in which traditional and modern attitudes towards sexuality coexist (Bognár & Kmetty, 2020; Hevesi et al., 2022; Varsa, 2020). This cultural milieu offers an opportunity to investigate whether previously documented associations hold across diverse populations or whether unique patterns emerge due to cultural differences.

Specifically, Hungary's sociocultural landscape, characterized by a blend of collectivist and individualist values, may shape relationship dynamics differently from the predominantly individualistic societies of North America (e.g., Bakacsi et al., 2002). For instance, Hungarian women may exhibit distinct motivations for faking orgasms that reflect local gender norms, expectations of relational harmony, or attitudes towards sexual satisfaction (Csányi et al., 2024a). Similarly, the relationship between sociosexuality and mate retention behaviors could differ in contexts where emotional intimacy in long-term relationships is highly valued.

By examining these phenomena in a Hungarian sample, this study sought to contribute to the cross-cultural validation of evolutionary psychological theories concerning female sexual behaviors. Demonstrating consistency with previous findings would support the universality of these mechanisms, while deviations could elucidate culturally specific adaptations, thereby enhancing our understanding of the interplay between evolution, culture, and human behavior. Consequently, this study represents not only an extension of prior research but also a crucial step in assessing the broader applicability and cultural sensitivity of established theories.

2. Hypotheses

Our proposed model is grounded in evolutionary psychological theories and empirical findings, which suggest that sociosexuality, relationship satisfaction, and mate-retention behaviors are interconnected predictors of strategic behaviors, such as faking orgasm. The sequence of effects in our model reflects an integrated understanding of how these variables influence one another. Specifically:

Sociosexuality as a Broad Dispositional Trait: Sociosexuality, as an individual difference reflecting openness to casual sexual relationships, has been shown to influence core

relationship processes such as commitment, satisfaction, and sexual strategies (Schmitt, 2005). Women with unrestricted sociosexuality often report lower relationship satisfaction in committed relationships, which may be explained by their openness to alternative mating opportunities that conflict with the exclusivity required for such relationships (Birnie-Porter & Hunt, 2015).

Relationship Satisfaction as a Mediating Process: Relationship satisfaction has been proposed as a potential mediator of the association between sociosexuality and mate-retention behaviors, as it may be associated with the perceived risk of infidelity or abandonment. Research suggests that lower satisfaction tends to co-occur with heightened mate-retention efforts, possibly because individuals who feel less secure in their relationship are more likely to engage in strategies aimed at reinforcing their partners' commitment and preventing infidelity (Buss & Shackelford, 1997; Shackelford et al., 2005; Kaighobadi et al., 2012). Conversely, higher satisfaction is typically linked to lower perceived risks and reduced engagement in mate-retention behaviors. This mediation effect arises because sociosexuality influences the degree to which individuals find long-term relationships fulfilling and rewarding. Prior research suggests that individuals with unrestricted sociosexuality tend to report lower satisfaction in committed relationships (Birnie-Porter & Hunt, 2015) as their openness to casual encounters may conflict with the emotional exclusivity expected in monogamous partnerships. In turn, lower satisfaction was associated with more frequent mate-retention behaviors. By contrast, individuals with more restricted sociosexuality tend to experience greater relationship satisfaction, reducing the perceived need for mate-retention efforts. Thus, sociosexuality indirectly shapes mate retention strategies through its effects on relationship satisfaction.

Mate-retention Behaviors as Proximal Predictors of Faking Orgasm: Faking orgasm is conceptualized as a specific mate-retention strategy that reinforces a partner's emotional or sexual investment. Cost-inflicting and benefit-provisioning mate-retention behaviors, often employed in response to relationship dissatisfaction or perceived infidelity threats, predict the likelihood of a faking orgasm (Kaighobadi et al., 2012; McCoy et al., 2015).

Thus, mate-retention behaviors acted as immediate predictors of faking orgasm in our model. This sequence is consistent with a structural equation modeling (SEM) framework that allows us to test the directional relationships hypothesized above. This structure assumes that broader dispositional traits (sociosexuality) influence proximal relationship dynamics (relationship satisfaction), which in turn shape specific behaviors (mate-retention strategies and faking orgasm). By structuring the model in this manner, we aimed to disentangle the interrelationships between these variables and provide a theoretically informed explanation of the observed patterns.

Cooper et al. (2014) found that women fake orgasm for different reasons depending on the sexual context. During sexual intercourse, motivations such as altruistic deceit (enhancing the partner's experience) and sexual adjustment (ending the sexual encounter) are more prominent, whereas during oral sex, insecure avoidance (evading discomfort or embarrassment) and fear of dysfunction (concerns about sexual performance) play a larger role. These distinct motivational patterns justify the expectation of differential effects between the two contexts, as reflected in our hypothesis.

Based on these theoretical considerations, we formulate two alternative models. One set of hypotheses (H1 and H2) assumed that the predictors of faking orgasm differ depending on sexual context (intercourse vs. oral sex), whereas the other (H3) proposed a unified prediction across contexts. Therefore, these are considered competing hypotheses that reflect different levels of generality.

Hypothesis # 1: In line with the context-specific model, more frequent mate-retention behaviors, lower relationship satisfaction, and unrestricted sociosexuality are expected to predict a higher probability of faking orgasm during sexual intercourse.

Hypothesis # 2: In addition, within the context-specific model, less frequent mate-retention behaviors, higher relationship satisfaction, and more restricted sociosexuality are expected to predict a higher probability of faking orgasm while receiving oral sex. Previous research has highlighted distinct motivational patterns for faking orgasm in intercourse and oral sex. Cooper et al. (2014) found that during intercourse, motivations such as altruistic deceit and sexual adjournment are more prominent, whereas during oral sex, insecure avoidance and fear of dysfunction play a larger role. Based on these findings, we hypothesized that predictors of faking orgasm might function differently in the two contexts.

Hypothesis # 3: In the context-independent model, we expect a sequential relationship such that more unrestricted sociosexuality will be linked to lower relationship satisfaction, which in turn will predict more frequent mate-retention behaviors. These behaviors are expected to increase the likelihood of faking orgasm, regardless of whether sexual activity involves intercourse or oral sex. Relationship satisfaction, in turn, is associated with mate-retention behaviors such that lower satisfaction is linked to more frequent mate-retention behaviors. Finally, mate-retention behaviors are associated with faking orgasm, such that more frequent cost-inflicting and benefit-provisioning mate-retention behaviors are linked to a higher probability of faking orgasm, both during sexual intercourse and while receiving oral sex.

3. Method

3.1. Participants

Participants were recruited through online advertisements posted on social media platforms and distributed via email to newsletters targeting Hungarian women. The advertisements invited women to participate in an anonymous online survey on sexual behavior and relationship dynamics. No monetary or material incentives are offered. Instead, the participants were informed about the scientific purpose of the study and the potential value of their contribution to the research.

In total, 468 participants completed the questionnaire. We excluded six participants who were identified as male, three who were identified as non-binary, three who reported having no prior sexual experience with a partner, and six who were identified as asexual. Data from 449 women were analyzed, all of whom were assigned female at birth and identified as women.

We conducted an a priori power analysis using G*Power (Faul et al., 2007) to test the sample size adequacy for binomial regression analysis. The analysis indicated a required minimum overall sample size of 134 using a conservative approach ($|\rho| = 0.23$, $1\text{-}\beta = 0.95$). We also conducted a priori power analysis for structural equation modeling (SEM) using pwrSEM (Wang et al., 2021). This analysis indicated a required minimum overall sample size of 202 with a medium effect size ($\beta = 0.25$), with at least 80% achieved power for each predictor based on 1000 Monte Carlo simulations. However, we sought to collect more data because we would only include participants in the SEM who had reportedly faked orgasm, either during sexual intercourse or while receiving oral sex, so that each of the two subgroups would exceed the minimum sample size.

Participants' ages ranged from 18 to 64 years (M = 33.95; SD = 10.14). Most of the participants (96.8%) had completed secondary or tertiary education (13–15 years of formal education). The relationship status of the participants varied as follows: 42 (9.4%) were single and currently had no sexual partner, 14 (5.1%) were single but had occasional sexual partners, 102 (22.7%) were in a committed but not cohabiting relationship, 140 (31.2%) were in a cohabiting relationship but were neither married nor in a registered partnership, and 139 (31.0%) were in a registered partnership or married. Additionally, 12 participants (2.7%) reported having a relationship status different from that listed (e.g., widowed, friends with benefits, secret lover, and polyamorous). The mean relationship length was 79.41 months (SD = 101.48). To ensure that all participants had relevant relationship experience, we asked: 'Have you ever been in a romantic relationship for at least three months?' All participants answered affirmatively, confirming that they had prior relationship experience.

Regarding sexual orientation identity, 310 participants (69.0%) reported being exclusively heterosexual, 121 (24.7%) were predominantly heterosexual with only incidental homosexual experiences, 12 (2.7%) were predominantly heterosexual but more than incidentally homosexual, and 16 (3.5%) selected other response options. Participants were asked about their experiences of faking orgasm during intercourse and oral sex, but the survey did not specify the gender of their partners in these encounters. Therefore, responses from participants with a non-exclusive heterosexual orientation may reflect their experiences with partners of different sexes.

Of the 449 participants, 212 (47.2%) reported having faked an orgasm while receiving oral sex and 290 (64.6%) reported having faked an orgasm during sexual intercourse. A total of 186 (41.4%) participants had a fake orgasm in both contexts, while 133 participants (29.6%) reported never having fake an orgasm in either situation. Participants who had never faked an orgasm (N = 133) were not included in analyses that required the Faking Orgasm Scale (FOS) but remained in the dataset for all other analyses, including those examining sociosexuality, relationship satisfaction, and mate retention behaviors.

Participants indicated their age, gender identity, sex at birth, type of residence, education, and relationship status. Furthermore, those currently involved in a romantic relationship indicated the duration of the relationship in months. Participants also answered a screening question about their prior relationship experience (‘Have you ever been in a romantic relationship for at least three months?’) Only those who responded affirmatively were included in the analysis of relationship satisfaction and mate retention.

All the participants completed the questionnaire online via Qualtrics. The survey link was distributed through social media platforms (e.g., Facebook and Instagram) and university mailing lists to reach a diverse sample. To maximize heterogeneity, we ensured broad accessibility across different population segments. Participation was voluntary, and no incentives were provided. Informed consent was obtained from all the respondents before participation. This study was approved by the Hungarian United Ethical Review Committee for Research in Psychology (Ref. No. 2022/107) and was not preregistered.

To ensure data quality, the survey was configured to allow only one response per device using browser cookies and IP restrictions. No personally identifying information (e.g., names, email addresses, or IP addresses) was collected. All responses were stored anonymously on a secure server, and data were analyzed in aggregate form only. These procedures were designed to preserve participants’ privacy and to encourage honest reporting, particularly given the sensitive nature of the topic.

3.2. Measures

As no Hungarian version of the Mate Retention Inventory was available at the time of data collection, the last author translated the questionnaire items and instructions into Hungarian. The translated version was checked for consistency using the back-translation method (Brislin, 1983; Hambleton and De Jong, 2003; Muñiz et al., 2013). This involved an independent translator retranslating Hungarian items and instructions into English. Minor discrepancies identified during the back-translation procedure were addressed by the two translators.

3.2.1. Mate Retention Inventory Short Form (MRI–SF)

The MRI–SF (Buss, Shackelford, & McKibbin, 2008) is a self-report questionnaire designed to assess variations in mate-retention behavior. This measure evaluates how individuals attempt to prevent their romantic partners from engaging in infidelity or leaving the relationship by employing a variety of behavioral tactics. Although the Mate Retention Inventory Short Form (MRI-SF) has been described in multiple factor structures in prior research, in the present study, we followed the two-factor structure of Intersexual Manipulation and Intrasexual Manipulation, as reflected in Table 3. Intersexual Manipulation refers to strategies aimed directly at romantic partners to maintain commitment and discourage infidelity. These behaviors include direct guarding (e.g., actively monitoring a partner's whereabouts, limiting social interactions with attractive others, or displaying protective behaviors to ensure exclusivity; e.g., "I ask my partner to inform me of their whereabouts at all times."), negative intersexual inducements (e.g., using guilt, jealousy, or emotional pressure to discourage infidelity; e.g., "I tell my partner that I would be very upset if they spent time with an attractive acquaintance). and positive inducements (e.g., enhancing relationship satisfaction through affectionate gestures, gifts, or sexual intimacy to strengthen emotional bonds; e.g., "I compliment my partner frequently to make them feel valued."). Intrasexual Manipulation encompasses tactics directed at potential romantic rivals, aimed at reducing competition for the partner's attention. These behaviors include public possession signals (e.g., making the relationship visible to deter competitors; e.g., "I hold hands with my partner in public to show that we are together."). and negative inducements toward rivals (e.g., undermining potential romantic threats by derogating competitors or limiting their access to the partner; e.g., "I tell my partner negative things about people who might be interested in them romantically."). Participants reported the frequency of each behavior over the past six months on a four-point scale, ranging from 0 (never) to 3 (often). Higher scores on these scales indicate more frequent engagement in mate-retention strategies. In our analysis, we used both the individual Intersexual and Intrasexual Manipulation scores, as well as a composite total score, to capture the overall mate-retention effort. In the present sample, the McDonald's

ω values were .89 for the total MRI-SF score, .82 for the Intersexual Manipulation subscale, and .77 for the Intrasexual Manipulation subscale.

3.2.2. Relationship Assessment Scale (RAS–H)

The RAS (Hendrick, 1988; adapted for Hungarians by Martos et al., 2014) is a self-report instrument designed to assess individual differences in relationship satisfaction. The Hungarian version, known as RAS-H, consists of eight items that measure overall satisfaction with the respondent's current or previous intimate partner relationships. This version includes an additional item, 'How satisfactory do you find your sexual relationship?' which was not included in the original seven-item scale. Participants responded to each item using a five-point scale, where 1 represented extreme dissatisfaction (e.g., "Not at all satisfied") and 5 represented extreme satisfaction (e.g., "Very satisfied"). McDonald's ω value for this measure was .89.

3.2.3. Revised Sociosexual Orientation Inventory (SOI-R)

The SOI-R (Penke & Asendorpf, 2008; Hungarian version by Meskó et al., 2014) is a nine-item self-report measure designed to assess individual differences in sociosexuality or non-committed sexual behavior. It is divided into three subscales: Sociosexual Behavior, Sociosexual Attitude, and Sociosexual Desire. Each subscale is comprised of three items. For the Sociosexual Behavior subscale, participants indicated the number of non-committed sexual encounters they had ever been involved in, using a nine-point scale ranging from "1 = 0" to "9 = 20 or more." The items of the Sociosexual Attitude subscale were also rated on a nine-point scale ranging from "1 = Strongly disagree" to "9 = Strongly agree." The Sociosexual Desire subscale was similarly rated, with options ranging from "1 = Never" to "9 = At least once a day." The use of the total score is supported by the Hungarian adaptation study by Meskó et al. (2014), which confirmed the original three-factor structure and demonstrated strong internal consistency for both the global index (α = .85) and the subscales. Notably, the three subdimensions showed high intercorrelations (rs > .67), supporting the use of an overall sociosexuality index, particularly when the theoretical aim is to capture general mating orientation. These findings align with the original authors' recommendation (Penke & Asendorpf, 2008) that a global score can be meaningfully used in structural modeling. Only the nine-item overall measure was used in the present study, in which higher scores reflected a more unrestricted sociosexual orientation, that is, more openness to non-committed sexual encounters. McDonald's ω value for this measure was .80.

3.2.4. Faking Orgasm

In this study, faking orgasm was assessed using two complementary approaches. First, two binary-coded screening items were used to determine whether participants had ever faked

an orgasm: (1) “Have you ever faked an orgasm during sexual intercourse?” and (2) “Have you ever faked an orgasm during oral sex?” These items allowed for the classification of participants into fakers and non-fakers in each sexual context and served as a basis for further scale administration. Only those who responded affirmatively were asked to complete the Faking Orgasm Scale for Women (FOS; Cooper et al., 2014; Hungarian version by Csányi et al., 2024b), a 56-item self-report instrument that measures the frequency and motivations behind orgasm simulation. The scale consists of two subscales: 33 items targeting sexual intercourse and 23 items targeting oral sex. Each item is rated on a 5-point Likert scale ranging from “1 = Never” to “5 = Always,” thereby capturing the frequency with which specific faking behaviors occur within each sexual context. The Sexual Intercourse subscale assesses four dimensions—Altruistic Deceit, Fear and Insecurity, Elevated Arousal, and Sexual Adjournment—while the Oral Sex subscale evaluates Altruistic Deceit, Insecure Avoidance, Elevated Arousal, and Fear of Dysfunction. In the present study, only the total scores of the sexual intercourse (FOS-I) and oral sex (FOS-O) subscales were used, providing continuous outcome variables reflecting the overall frequency of faking orgasm in each context. McDonald’s ω values for FOS-I and FOS-O were .92 and .86, respectively, indicating excellent internal consistency.

3.3. Data analyses

To comprehensively examine the occurrence and frequency of faking orgasm, we employed a two-stage analytical strategy. First, to identify individual and relational predictors distinguishing women who have engaged in orgasm simulation from those who have not, we conducted binomial logistic regressions (N = 449, the total sample). Here, the outcome variable was the answer to the screening items used to determine whether participants had ever faked an orgasm. Two models were tested, one for intercourse and one for oral sex. Second, among participants who reported having faked orgasm (N = 290 for intercourse and N = 212 for oral sex), we conducted structural equation modeling (SEM) with continuous outcome variables (FOS-I and FOS-O total scores), which reflect the frequency of faking behavior in each sexual context. This dual-level approach allowed us to examine both the prevalence and intensity of orgasm simulation and to test more nuanced associations between sociosexuality, relationship satisfaction, mate retention behaviors, and faking orgasm.

To explore the significant predictors of faking orgasm, we performed two separate binomial regression analyses using binary outcome variables indicating whether participants had ever faked an orgasm during sexual intercourse or while receiving oral sex. These analyses allowed us to compare fakers and non-fakers in each sexual context based on their scores on mate-retention behavior, relationship satisfaction, and sociosexual orientation. The independent

predictors in both models were mate-retention behavior, relationship satisfaction, and sociosexual orientation, and were tested using the enter method. All assumptions were met in the regression analysis. The entire sample (N=449) was used for analyses.

We then performed Structural Equation Modeling (SEM) to test our proposed model that sociosexuality (SOI-R) affects faking orgasm via relationship satisfaction, whereas relationship satisfaction predicts the probability of faking orgasm via mate-retention behaviors. In contrast to the binary outcome used in the regression models, here we employed continuous outcome variables based on the Faking Orgasm Scale (FOS) total scores for each sexual context. The SOI-R, MRI, FOS-I, and FOS-O scales were defined as latent variables that consisted of the respective subscales of each measure entered as observed variables, while the RAS-H was entered as an observed variable because it was used as a unidimensional measure. The analysis was performed on those who reported that they had faked orgasm in the past (N = 212 for receiving oral sex and N = 290 for sexual intercourse). Prior to analysis, we assessed the normality of the total scores by examining skewness and kurtosis values. Most variables fell within acceptable limits (i.e., between -2 and +2), suggesting no serious violation of normality assumptions. Nevertheless, to minimize potential bias from variable distributions, we standardized all variables and applied a robust estimator (diagonally weighted least squares) in the structural equation modeling (Bandalos, 2014). To evaluate model fit, we used the relative chi-square ($\chi 2/df$), comparative fit index (CFI), Bollen's incremental fit index (IFI), root mean square error of approximation (RMSEA), and standardized root mean squared residual index (SRMR). The cutoff values for good model fit were defined as a relative chi-square of 3 (or below), CFI and IFI values of 0.95 (or), and RMSEA and SRMR values of 0.08 (or below; Brown & Cudeck, 1992; Hu & Bentler, 1998).

The data that support the findings of this study are available from the OSF page of the study: https://osf.io/6243h/?view_only=5a1ba3f6f26e4b2881e3c359a846adb9. All statistical analyses were performed using the JAMOVI Statistics Program version 2.0 for Windows (Jamovi Project, 2022).

4. Results

First, we tested our hypothesis regarding predictors of faking orgasm during sexual intercourse. Table 1 shows the detailed statistical results, including the odds ratios (ORs) and p-values. The regression model was significant ($\chi 2(3) = 15.8$, $p = 0.001$, Nagelkerke's $R2 = 0.05$). In line with our hypothesis, more frequent mate-retention behavior (MRI), lower relationship

satisfaction (RAS-H), and more unrestricted sociosexuality (SOI) increased the likelihood of faking orgasm during sexual intercourse.

Table 1. *Effects of the tested predictors on faking orgasm during sexual intercourse and oral sex (N = 449).*

			95% CI					95% CI	
	Predictor	**B**	**Lower**	**Upper**	**Z**	**p**	**OR**	**Lower**	**Upper**
Sexual	SOI	0.018	0.002	0.034	2.31	0.021	1.019	1.003	1.035
intercourse	RAS	-0.053	-0.104	-0.002	-2.05	0.040	0.948	0.900	0.998
	MRI	0.015	0.001	0.031	2.03	0.043	1.016	1.001	1.032
Oral sex	SOI	0.016	0.001	0.031	2.154	0.031	1.016	1.001	1.030
	RAS	-0.041	-0.088	0.004	-1.752	0.080	0.959	0.915	1.000
	MRI	0.018	0.004	0.032	2.531	0.011	1.019	1.004	1.030

Notes: SOI: Unrestricted sociosexual orientation. RAS-H: relationship satisfaction. MRI: mate-retention behavior. Heterosexual orientation was coded as a continuous variable ranging from exclusively homosexual to exclusively heterosexual. Estimates represent the log odds of faking orgasm (1) versus not faking orgasm (0). B values are point estimates, ORs (odds ratios) are standardized estimates.

We then tested our hypothesis regarding predictors of faking orgasm during oral sex. Table 1 shows the detailed statistical results, including ORs and p-values. The regression model was significant ($\chi2(3) = 15.3$, $p = 0.002$, Nagelkerke's $R2 = 0.05$). Consistent with our hypothesis, more frequent mate-retention behavior (MRI) and unrestricted sociosexuality (SOI) increased the likelihood of faking orgasm while receiving oral sex. Contrary to our hypothesis, lower relationship satisfaction (RAS-H) was not a significant predictor in the tested model. These two regression models used binary outcome variables to classify participants based on whether they had ever faked an orgasm during sexual intercourse or oral sex. This binary distinction not only allowed us to identify individual and relational predictors of faking but also served as a screening step for administering the Faking Orgasm Scale (FOS).

Subsequently, we tested the hypothesized effects of sociosexual orientation (SOI-R), relationship satisfaction (RAS-H), and mate-retention behaviors (MRI) on the frequency of faking orgasm, using continuous outcome variables derived from the FOS. The scale was administered only to those who had previously reported faking orgasm in the relevant sexual context. Unlike the binary screening items, the FOS captures not merely the occurrence but also the intensity and motivational dimensions of orgasm simulation, thus allowing for more nuanced analyses. Each of the two outcome variables was entered into one of two separate models with

otherwise identical structures. Regarding faking during sexual intercourse, the test yielded an acceptable model fit ($\chi 2/df = 1.89$, $p = 0.002$, CFI = 0.928, IFI = 0.931, RMSEA = 0.055, 95% CI = [0.033–0.077], SRMR = 0.057). Table 2 shows the detailed statistical results, including the standardized estimates and p-values. Unrestricted sociosexual orientation (SOI) negatively predicted relationship satisfaction (RAS-H), while relationship satisfaction positively predicted mate-retention behavior (MRI), which, in turn, positively predicted faking orgasm during sexual intercourse (FOS-I). We then tested a separate model to predict faking orgasm during receiving oral sex.

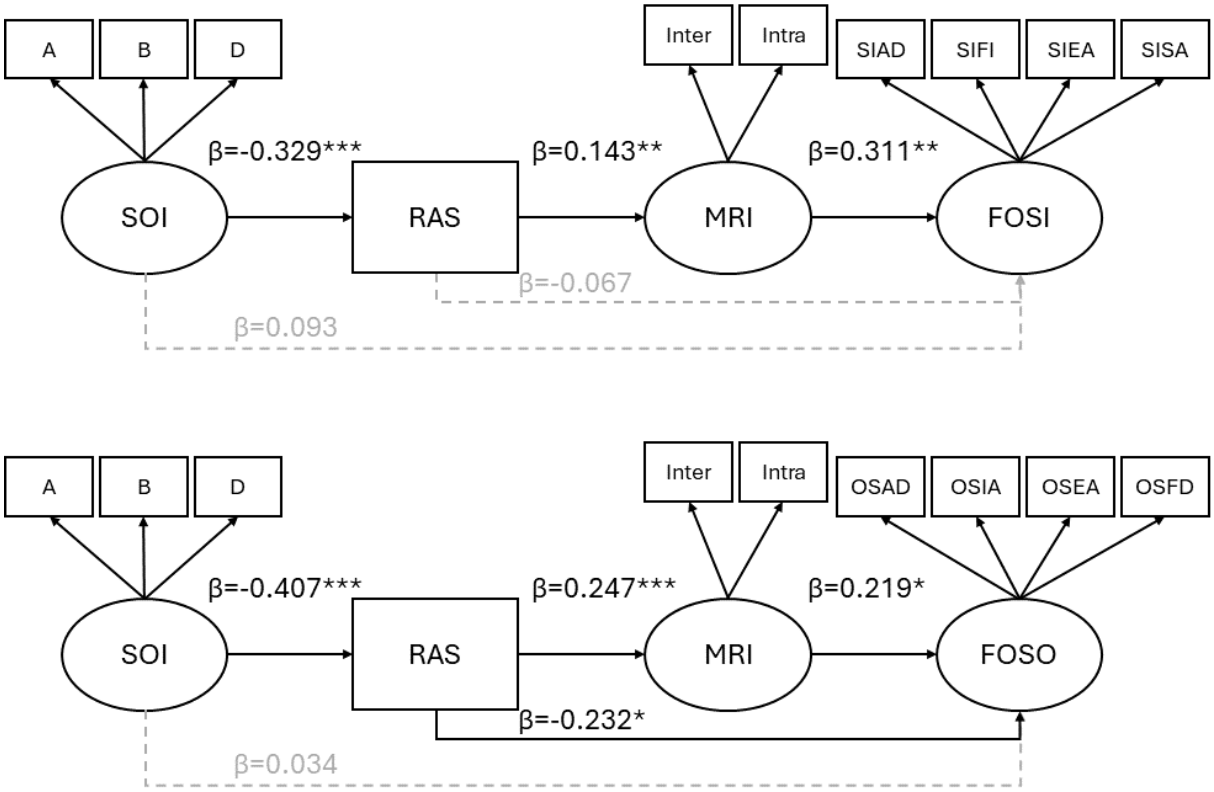


Figure 1. *The model of the hypothesized hierarchical effects on faking orgasm, separately for faking during sexual intercourse (top panel) and during oral sex (bottom panel). All the pathways are displayed. Continuous black lines indicate statistically significant pathways (* p < 0.05, ** p < 0.01, *** p < 0.001), while dashed gray lines indicate non-significant pathways. All reported estimates were standardized point estimates (N = 449).*

For faking during oral sex, the test yielded a good model fit ($\chi^2/df = 1.2$, $p = 0.204$, CFI = 0.976, IFI = 0.977, RMSEA = 0.031, 95% CI = [0.000–0.063], SRMR = 0.052). Table 2 shows the detailed statistical results, including the standardized estimates and p-values. Unrestricted sociosexual orientation (SOI) negatively predicted relationship satisfaction (RAS-H) and relationship satisfaction positively predicted mate-retention behavior (MRI). Additionally, relationship satisfaction directly predicted a lower likelihood of faking orgasm while receiving oral sex (FOS-O). Mate-retention behavior, in turn, positively predicted faking orgasm. These results

indicate both a direct and indirect path from relationship satisfaction to faking orgasm in the context of oral sex. These results are consistent with our hypothesis regarding the effects of faking orgasms. Table 3 provides detailed descriptive statistics of the key variables included in the study. Supplementary Table 1 provides the zero-order correlations between the key variables examined in this study.

Table 2. *Results of structural equation modeling for faking orgasm during sexual intercourse and oral sex (N = 449).*

				95% CI			
	Dependent	**Predictor**	**β**	**Lower**	**Upper**	**z**	**p**
Sexual Intercourse	RAS-H	SOI	-0.328	-0.442	-0.214	-4.603	< .001
	MRI	RAS-H	0.143	0.040	0.246	2.785	0.005
	FOS-I	RAS-H	-0.066	-0.215	0.082	-0.874	0.382
	FOS-I	SOI	0.093	-0.043	0.229	1.302	0.193
	FOS-I	MRI	0.311	0.185	0.436	2.707	0.007
Oral Sex	RAS-H	SOI	-0.407	-0.405	-0.158	-4.278	< .001
	MRI	RAS-H	0.247	0.066	0.325	2.910	< .001
	FOS-O	RAS-H	-0.232	-0.392	-0.023	-1.979	0.039
	FOS-O	SOI	-0.034	-0.212	0.155	-0.302	0.712
	FOS-O	MRI	0.219	0.032	0.386	2.054	0.043

Note: RAS-H: Relationship satisfaction. SOI: Unrestricted sociosexual orientation. MRI: mate-retention behavior. FOS-I: Faking orgasm during sexual intercourse. FOS-O: Faking orgasm while receiving oral sex. Estimates (β) are standardized values.

5. Discussion

This study examined a theoretically grounded model of faking orgasm as a strategic behavior shaped by mate-retention efforts, relationship satisfaction, and sociosexual orientation. Based on previous research, we hypothesized that these variables would interact to predict faking orgasm in different sexual contexts. By testing these pathways, our study contributes to a broader understanding of the psychological mechanisms underlying the faking orgasm and its potential relational functions. Several studies (Csányi et al., 2024a,b; Cooper et al., 2014; Láng et al., 2020) have suggested that women's faking orgasm can be examined in two sexual contexts: during sexual intercourse, and while receiving oral sex. Considering related findings, we also explored the psychological factors of faking orgasm among Hungarian women in both contexts. To capture both the occurrence and frequency of faking orgasm, we implemented a two-step measurement approach. First, dichotomous screening items identified participants who had ever faked an orgasm during sexual intercourse or oral sex. Only those who responded affirmatively were then asked to complete a frequency-based self-report measure—the Faking

Orgasm Scale (FOS)—which assessed how often specific faking behaviors occurred in each context.

Table 3. *Detailed descriptive statistics of the key variables included in this study (N = 449).*

Variable	Mean	Median	SD	Minimum	Maximum
SOI Total	35.65	36.00	13.346	10.00	73.00
SOI B	9.47	8.00	5.154	3.00	27.00
SOI A	17.49	18.00	7.370	3.00	27.00
SOI D	8.68	7.00	4.952	3.00	26.00
RAS-H	28.07	29.00	4.262	8.00	36.00
MRI Inter	24.59	24.00	10.350	0.00	65.00
MRI Intra	10.41	10.00	4.267	0.00	26.00
MRI Total	35.00	34.00	13.594	0.00	90.00
FOS OSAD	3.74	4.00	1.047	1.00	5.00
FOS OSIA	2.38	2.13	1.036	1.00	5.00
FOS OSEA	1.75	1.60	0.748	1.00	4.20
FOS OSFD	2.05	2.00	0.893	1.00	4.25
FOS SIAD	3.46	3.67	1.109	1.00	5.00
FOS SIFI	1.96	1.70	0.932	1.00	4.90
FOS SIEA	1.88	1.50	0.998	1.00	5.00
FOS SISA	2.49	2.33	1.119	1.00	5.00

Note: SOI Total: total score on the Sociosexual Orientation Index. SOI B: sociosexual behavior. SOI A: Sociosexual attitudes. SOI D: sociosexual desire. RAS-H: Hungarian Relationship Assessment Scale. MRI Inter: mate retention intersexual manipulation domain. MRI Intra: mate retention intrasexual manipulation domain. MRI Total: total score of Mate Retention Inventory. FOS: Faking Orgasm Scale. Oral Sex subscales. OSAD: Altruistic Deceit. OSIA: Insecure Avoidance. OSEA: Elevated Arousal. OSFD: Fear of Dysfunction. Sexual Intercourse subscales. SIAD: Altruistic Deceit. SIFI: Fear and Insecurity. SIEA: Elevated Arousal. SISA: Sexual Adjournment.

Our findings confirmed most of the predicted statistical relationships, showing that more frequent mate-retention behaviors, lower relationship satisfaction, and more unrestricted sociosexuality were associated with a higher likelihood of faking orgasm during sexual intercourse. These results are consistent with those of previous studies. For instance, Kaighobadi et al. (2012) found that women who were more prone to fake orgasms reported more frequent engagement in mate retention behaviors. A possible explanation for this finding is that faking an orgasm is a mate-retention strategy aimed at preventing a partner's infidelity or quitting the relationship. Our findings were consistent with this explanation. Biermann et al. (2021) and Séguin and Milhausen (2016) propose two different, yet potentially complementary explanations. While Biermann et al. highlighted the role of deception in concealing dissatisfaction, Séguin and Milhausen suggested that faking for love-related reasons could function as a relationship maintenance strategy. Future research should investigate whether these mechanisms

operate independently or interact within different relational contexts. Recent research has also begun to address an important but previously overlooked dimension of the phenomenon—namely, why women stop faking orgasm. In a large cross-national study involving over 12,000 women from six European countries, Pavan et al. (2024) found that discontinuing the behavior was associated with improved sexual communication and greater self-acceptance. These findings suggest that faking orgasm is not merely a static behavior driven by enduring personality traits or relational deficits but may instead evolve alongside changes in relational dynamics. This underscores the importance of studying not only the occurrence and motivations of faking, but also the psychological and interpersonal conditions under which women may choose to discontinue the behavior.

Wiederman (1997), analyzing a representative American sample, found that women who faked orgasm reported more frequent casual sexual encounters (with multiple partners) than those who did not fake orgasm. This suggests that a faking orgasm may be more common in socially unrestricted individuals who are more engaged in short-term mating. However, Jonason (2019) argues that the critical difference between individuals with short- and long-term relational orientations is not in the frequency of faking orgasm, but in its underlying motivations. While individuals with short-term orientations may be fake for hedonistic reasons (e.g., avoiding boredom or deceiving partners), those in long-term relationships are more likely to use faking as a form of positive reinforcement. Our findings align with this distinction as we observed that sociosexuality was indirectly linked to faking orgasm through relationship satisfaction and mate retention strategies. Future research could further investigate whether the motivations behind a faking orgasm differ systematically among individuals with varying sociosexual orientations and relational goals. Such work could also build on qualitative findings suggesting that young women's faking behavior may be influenced by media portrayals and normative beliefs about sexual performance (Howes, 2019).

Our hypothesized relationships for faking orgasm during oral sex were not supported because more frequent mate-retention behaviors increased (rather than decreased) the likelihood of faking orgasm, whereas sociosexuality and relationship satisfaction were not significant predictors. Our hypotheses were based on prior findings that mate retention behaviors are often motivated by concerns about partner fidelity and relationship security (Kaighobadi et al., 2012). We expected that these concerns would manifest differently in intercourse and oral sex contexts, given that sexual intercourse is often more directly linked to reproductive and pair-bonding mechanisms (Buss, 2016). However, our findings suggest that the psychological dynamics of faking orgasm may not be context dependent, as hypothesized. One possible explanation is that

motivations for faking orgasm are more stable across sexual behaviors than previously assumed. Alternatively, as some research suggests (e.g., Harvey et al., 2023), women may feel less pressure to fake orgasm during oral sex because it provides direct clitoral stimulation and is often interpreted as a behavior that prioritizes female pleasure. Future research should explore whether women's perceived need for fake orgasm varies across different sexual acts, depending on their expectations and partner dynamics.

One possible factor contributing to these unexpected findings is the distinction between cost-inflicting and benefit-provisioning mate retention strategies (Miner et al., 2009). It is possible that different types of mate retention behaviors have distinct associations with faking orgasm depending on sexual context. For example, benefit-provisioning strategies (e.g., affectionate gestures) may be more strongly linked to a faking orgasm during oral sex as a positive reinforcement tactic, whereas cost-inflicting strategies (e.g., jealousy induction) may play a lesser role. Future research should differentiate between these types of strategies when examining the predictors of faking orgasm across various sexual behaviors.

This finding may be partly explained by the results of a previous study by Bryan (2001), who concluded that women generally fake orgasms less frequently during oral sex than during sexual intercourse. One possible explanation is that oral sex, which typically involves direct clitoral stimulation, is more likely to result in orgasm than is intercourse. As a result, women may feel less compelled to feel fake during oral sex and are more inclined to end unsatisfying intercourse through simulation. This interpretation aligns with empirical findings showing higher orgasm rates for women during oral sex than during penetrative intercourse (Vannier & O'Sullivan, 2012).

Path analysis of the predictors of faking orgasm during sexual intercourse revealed that unrestricted sociosexuality was negatively associated with relationship satisfaction, which in turn was positively associated with mate-retention behaviors. These behaviors were further associated with a higher likelihood of faking orgasm during sexual intercourse. For the predictors of faking orgasm while receiving oral sex, the analysis showed that unrestricted sociosexuality negatively predicted relationship satisfaction, relationship satisfaction positively predicted mate-retention behaviors and negatively predicted (as a direct predictor) faking orgasm during oral sex, while mate retention behavior positively predicted faking orgasm during oral sex.

Our findings suggest that sociosexuality plays a crucial role in shaping women's faking orgasm behavior as it indirectly affects relationship satisfaction and mate retention strategies. Women with more unrestricted sociosexuality, who are inclined towards short-term mating, are more likely to report a faking orgasm, which may reflect manipulative purposes or attempts to

manage relationship dynamics. This aligns with Jonason's (2019) theory that sociosexual orientation influences motivation for faking orgasm. Furthermore, our findings are consistent with the results of Leonhardt et al. (2018), who found that lower relationship satisfaction was associated with reduced orgasm frequency and increased faking behavior. Future research should explore whether these effects hold across both relational and cultural contexts.

Therefore, women reporting lower relationship satisfaction were also less likely to report experiencing orgasm with their partners and more likely to report faking satisfaction. A similar conclusion was proposed by Hevesi et al. (2022), who found in a sample of Hungarian women that difficulties and enjoyment of orgasm were negatively and positively predicted by relationship satisfaction, respectively. Biermann et al. (2021) also found that Brazilian women who more frequently faked orgasm were less satisfied with their relationships. This suggests that women with lower relationship satisfaction may find it harder to achieve an orgasm during sexual intercourse. Similar associations were observed in a Hungarian sample by Hevesi et al. (2021), who found that women experiencing orgasmic difficulties were significantly more likely to fake orgasm in committed relationships, highlighting the joint contribution of sexual dysfunction and relational context to this behavior.

According to our results, mate retention was another mediator between unrestricted sociosexuality and faking orgasm. The results show that the more frequent mate-retention behaviors a woman engages in within her relationship, the more likely she is to fake an orgasm. This finding is consistent with that of Muehlenhard and Shippee (2010) and Biermann (2021). Whether women primarily use faking as a deceptive strategy to conceal dissatisfaction or as a relational signal intended to reinforce emotional closeness and partner satisfaction remains an open question. While the former reflects concealment or manipulation, the latter may function as a form of strategic affirmation — not of personal orgasmic experience but of commitment, intimacy, or desire to maintain a harmonious interaction.

Our findings indicate that relationship satisfaction positively predicts mate retention behaviors and mate retention behaviors positively predict faking orgasm. This suggests that women who are more satisfied with their relationships engage in mate retention behaviors more frequently, which in turn increases the likelihood of faking orgasm. However, our hypothesis originally predicted a negative association between relationship satisfaction and mate retention behaviors, based on the assumption that dissatisfaction with the relationship would trigger increased efforts to retain a partner. Instead, our results revealed a positive association, indicating that higher relationship satisfaction was linked to more frequent mate retention behaviors. One possible explanation is that mate retention behaviors, particularly benefit-provisioning

strategies, may involve proactive efforts to maintain an already satisfying relationship rather than a reaction to perceived instability (Buss, 1988; Miner et al., 2009). Previous research has suggested that individuals in committed and fulfilling relationships engage in mate retention behaviors to reinforce emotional closeness and prevent future threats to the relationship, even in the absence of immediate risk (Kaighobadi et al., 2012). While higher satisfaction was associated with greater mate retention efforts, the overall effect on faking orgasm may be influenced by different underlying motivations, such as securing a partner's commitment despite high satisfaction. Future research should further explore whether distinct mate retention strategies (e.g., cost-inflicting vs. benefit-provisioning) moderate this pathway (Shackelford & Buss, 1997). It is also possible that the positive association observed between relationship satisfaction and mate-retention behavior in women reflects broader sex differences in the relationship dynamics. On average, women are more likely than men to leave unsatisfactory relationships rather than increase retention efforts (Buss, 2016; Schmitt & Shackelford, 2008). By contrast, men may be more inclined to engage in mate retention as a reaction to declining satisfaction, especially to prevent partner abandonment. Since the present study focused exclusively on women, future research should directly examine whether these patterns differ across sexes and whether sex moderates the relationship between satisfaction and mate-retention behavior.

Our results showed that higher relationship satisfaction was associated with more frequent mate-retention behaviors, suggesting that women engage in such behaviors to prevent a satisfactory male partner from quitting the relationship or being unfaithful (Biermann et al., 2021). Mate retention behaviors may also signal to female rivals that the partner is already in a committed relationship and is investing resources therein (Schmitt & Buss, 2001).

Our results are consistent with those of previous studies. Brazilian (Biermann et al., 2021), American (McCoy et al., 2015), and Hungarian women (Láng et al., 2020) invariantly fake orgasms to enhance the quality of their sexual and emotional experiences for themselves and their male partners. These results align with the evolutionary hypothesis that women may have developed psychological mechanisms aimed at ensuring their male partners' emotional investment in the relationship, thereby reducing the likelihood of desertion (Buss & Shackelford, 1997).

While the present study focused on relationship satisfaction, sociosexuality, and mate retention as predictors of faking orgasm, future research may benefit from including additional variables that could further clarify these associations. For example, perceived partner infidelity risk has been shown to mediate the relationship between satisfaction and strategic sexual behaviors such as faking orgasm (Kaighobadi et al., 2012). Similarly, variables such as sexual

communication and emotional intimacy may serve as moderators, potentially buffering against deceptive behaviors or amplifying them in the context of relational insecurity. Personality traits, particularly neuroticism and anxious attachment, may also shape the emotional and motivational underpinnings of faking, particularly among women who are more sensitive to the perceived threats of abandonment or rejection. These factors could be integrated into dyadic or longitudinal designs to refine our understanding of the psychological mechanisms behind orgasm simulations. Moreover, qualitative studies such as Howes (2019) underscore the value of in-depth interviews in capturing the emotional nuances and contextual meanings of faking orgasm that are often overlooked in quantitative research designs.

Moreover, the unexpected positive association between mate-retention behaviors and faking orgasm in the context of oral sex suggests that additional motivational pathways may be at play. One possibility is that unlike in vaginal intercourse, faking during oral sex may serve more affiliative purposes, such as signaling appreciation or preserving emotional closeness, rather than guarding against infidelity. Since oral sex tends to center more on the partner's activity and less on female orgasmic certainty, simulating orgasm in this context may reflect gratitude or reciprocal bonding, especially in long-term or emotionally secure relationships. Future studies could assess these dynamics by including measures of perceived partner effort, relationship duration, or mutual investment.

6. Clinical and Sexological Implications

The findings of this study also carry important implications for clinical and therapeutic practice. While faking orgasm has traditionally been examined through evolutionary or social-psychological lenses, a growing body of research—including our own—suggests that this behavior may be embedded within deeper affective, relational, and communicational dynamics. Previous studies have shown that faking orgasm can serve as an emotion regulation strategy, particularly among women who struggle with impulse control, emotional clarity, or acceptance of distressing internal experiences (Meskó et al., 2025). In such cases, faking may function to avoid anticipated conflict or maintain relational harmony, often at the expense of authentic sexual expression. These patterns are particularly relevant to cognitive-behavioral frameworks, where maladaptive beliefs, rigid gender norms, and avoidance coping are addressed through interventions aimed at enhancing emotional awareness, assertiveness, and cognitive flexibility.

Moreover, faking orgasm may reflect relational insecurities rooted in anxious or avoidant attachment dynamics. For example, Láng et al. (2020) found that women with anxious attachment are more likely to report faking orgasm, potentially as a strategy to maintain closeness or

avoid perceived rejection. Such behaviors may reflect maladaptive relational scripts that could be addressed in emotionally focused couple therapy by reshaping interaction patterns and fostering secure emotional bonds. From a systemic perspective, faking may be viewed as a symptom of disrupted sexual communication, in which unmet needs and anxieties remain unspoken. Therapeutic efforts would thus focus on expanding sexual dialogue, renegotiating implicit expectations, and reinforcing mutual responsiveness and empathy. Given our findings that lower relationship satisfaction was associated with increased faking of orgasm, especially during vaginal intercourse, this behavior may serve as an indirect indicator of unmet emotional or sexual needs. Clinically, this suggests that faking orgasm could signal deeper relational dissatisfaction and may warrant exploration in therapy as a marker of disconnection or communication breakdown.

In line with these perspectives, Csányi et al. (2024a) have shown that faking motivated by avoidance or obligation is associated with lower sexual autonomy and greater sexual dissatisfaction. These findings resonate with contemporary sex therapy approaches that emphasize self-directed desire, sexual assertiveness, and individualized therapeutic goals. Clinical work might involve deconstructing internalized sexual scripts—particularly those that equate orgasm with partner validation—and fostering greater congruence between emotional and behavioral sexual expression. The observed association between mate retention behaviors and faking orgasm—especially among women who reported higher relationship satisfaction—may reflect internalized beliefs about female sexual responsibility and partner appeasement. In cognitive-behavioral or systemic therapy, such patterns can be addressed by deconstructing normative scripts around performance and obligation, and by renegotiating relational expectations in a collaborative therapeutic space.

Finally, Cooper's (2014) research underscores the importance of assessing women's individual motivations for faking orgasm. Latent class analyses revealed that some women fake in response to low self-esteem, relationship anxiety, or a desire to please their partner, while others do so to conceal orgasmic difficulties, such as anorgasmia. These findings call for a nuanced, non-pathologizing therapeutic stance in which faking orgasm is understood not merely as a deceptive act, but as a potentially communicative and protective strategy that may reflect deeper emotional or psychosexual vulnerabilities.

Our results, together with recent findings that women who stopped faking orgasm reported better sexual communication (Pavan et al., 2024), suggest that fostering open and non-judgmental sexual dialogue may play a crucial role in reducing the need for simulation. Therapeutic interventions should thus prioritize not only individual assertiveness but also dyadic

communication patterns to enhance sexual authenticity. Taken together, these findings highlight the importance of integrating frameworks from emotion regulation, attachment theory, and sexual autonomy into both individual and couple-based therapy. Faking orgasm should be understood as a potentially meaningful behavior embedded in the broader relational system and addressed as part of holistic efforts to foster sexual authenticity, satisfaction, and relational well-being. By linking our empirical findings to therapeutic frameworks, we aim to expand the applied relevance of this research and to offer clinicians potential entry points for addressing orgasm-related concerns in diverse relational contexts.

7. Limitation and Future Directions

Despite its contributions, this study had several limitations that should be addressed in future research. First, the cross-sectional design precludes any causal interpretations regarding the relationships between sociosexuality, relationship satisfaction, mate retention behaviors, and faking orgasm and prevents establishing the directionality or temporal order of these associations. Longitudinal or experimental designs can provide strong evidence of the directionality and mechanisms of these associations. While women may fake orgasm as a strategy to foster their partners' emotional investment, our study did not directly test whether this behavior effectively increases partner commitment. Future research should investigate how men perceive and respond to simulated orgasms in the context of their relationship dynamics.

Second, the sample, although sufficiently large, was limited to Hungarian women who were predominantly well-educated and heterosexual. This demographic homogeneity, combined with the potential effects of volunteer bias, restricts the generalizability of our findings to broader and more diverse populations in terms of education, relationship type, and sexual orientation. Future studies should include participants from various cultural, educational, and sexual backgrounds to explore the extent to which these patterns are universal and culture-specific.

Third, while our structural equation models provided insights into the interplay of sociosexuality, relationship satisfaction, and mate retention behaviors, they did not account for other potentially influential variables such as sexual communication, emotional intimacy, perceived partner infidelity risk, or personality traits (e.g., neuroticism or agreeableness), which may act as mediators or moderators in the relationships explored. Including these variables could yield a more nuanced understanding of the factors that influence faking orgasm.

Fourth, although we adopted the widely used two-factor structure of the Mate Retention Inventory–Short Form (MRI–SF) consisting of Intersexual and Intrasexual Manipulation, we

did not conduct an independent factor analysis of the scale in our Hungarian sample. Although this structure has demonstrated good psychometric properties in previous studies (Buss et al., 2008; Biermann et al., 2021), its factorial validity has not yet been established in this specific cultural context. Future research should validate the structure of MRI–SF in diverse populations, including Hungarian samples, to strengthen the reliability of such applications.

Fifth, we did not directly measure participants' perceptions of their partners' infidelity risks, which previous studies (Kaighobadi et al., 2012) have identified as a key mediator in the relationship between mate retention behaviors and faking orgasm. Future research should explicitly examine how perceived partner infidelity influences these dynamics in short- and long-term relationships.

Additionally, in line with previous studies using the Faking Orgasm Scale (e.g., Cooper et al., 2014), we employed a dual-level analytic approach. First, we compared women who had ever faked an orgasm with those who had never done so using binary-coded variables. This allowed us to examine broad group differences across the full sample. Second, we explored individual differences in faking frequency among those who had faked, based on their FOS scores. This two-step design reflects the structure of the phenomenon and aligns with the questionnaire's logic. Nevertheless, future research could further integrate these levels by modeling frequency-based predictors in the full sample, possibly through imputation or alternative scaling techniques.

Sixth, although our sample included some participants who were not currently in a relationship, all had prior relationship experience lasting at least three months, ensuring the validity of their responses regarding relationship satisfaction and mate retention behaviors.

Seventh, this study was subject to potential volunteer bias, which is a well-documented issue in research on sexual behaviors. Individuals who choose to participate in studies on sexuality may be more open to their sexual experiences, attitudes, and behaviors, which could limit the representativeness of the sample. Future research should aim to recruit more diverse participant pools, including those who may be less inclined to discuss their sexual behaviors, to ensure broader generalizability of the findings.

Eighth, our sample included participants with varying degrees of nonheterosexual orientation. However, we did not explicitly differentiate their responses based on the gender of their partners. This omission may limit the inclusivity and interpretability of our findings, as sexual motivations, communication patterns, and relational dynamics related to faking orgasm may differ significantly in same-gender or gender-diverse partnerships (Harvey et al., 2023). Although most participants reported being predominantly heterosexual, future studies should

explore how sexual orientation and partner gender influence faking orgasm in different relational contexts to ensure a more comprehensive and inclusive understanding of this behavior.

Finally, the study relied on self-reported data, which are susceptible to social desirability biases, especially regarding sensitive topics, such as sexual behaviors and relationship dynamics. Incorporating multi-method approaches, such as partner reports or behavioral observations, could mitigate this limitation and enhance the validity of the findings.

Notably, all the findings are based on cross-sectional correlational data, meaning that causality cannot be established. Although the models tested in this study were theoretically driven, alternative causal pathways or bidirectional influences cannot be ruled out. Longitudinal or experimental research is needed to determine the directionality of these associations.

Although our sample size was sufficiently large to ensure the robustness of parametric analyses, normality tests revealed deviations from normal distribution for several key variables, particularly the Faking Orgasm Scale and the Relationship Assessment Scale. While the regression and SEM analyses used in the present study are considered robust to such violations, the non-normality of the data should be acknowledged as a potential limitation that could influence the generalizability of parameter estimates.

Further investigations could examine the implications of faking orgasm on relationship outcomes over time, including satisfaction, stability, and sexual wellbeing. Additionally, exploring interventions that promote open communication about sexual needs and satisfaction may provide valuable insights into reducing the occurrence and potential relational costs of faking orgasm.

8. Conclusions

This study explored predictors of faking orgasm in the Hungarian context and highlighted relationship satisfaction as a significant factor associated with the likelihood of faking orgasm. This study underlines the importance of cross-cultural research on women's sexual psychology and behavior. The findings not only point out important future research directions but also have practical implications for clinical work with women and couples.

Forming an orgasm is a complex behavior with multiple motivations, including enhancing sexual and emotional experiences, managing partner expectations, and navigating relational dynamics (Muehlenhard & Shippee, 2010; Cooper et al., 2014). Our findings contribute to this growing body of research by demonstrating that sociosexuality, relationship satisfaction, and mate retention behavior are predictors of faking orgasm. However, these relationships are likely to be influenced by individual and contextual factors, which warrant further investigation.

Although this study was not designed as a clinical investigation, our findings offer a conceptual framework for understanding the emotional and relational dynamics underlying faking orgasm. This framework may inform future psychoeducational efforts and therapeutic work that aim to support more authentic and satisfying sexual experiences among women and couples.

While our findings highlight key predictors of faking orgasm, future research should examine how cultural expectations, and individual differences interact to shape this behavior in diverse relational contexts. Our study contributes to a broader understanding of women's sexual behaviors and provides a framework for future investigations of the psychological and relational dynamics of faking orgasm.

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5 | SUMMARY AND CONCLUSIONS

Summary

This thesis investigates the intricate interplay between human mating strategies, the psychology of sexuality, and relationship functioning. A central conclusion of this study is that sexual motivation operates as a critical component of broader mating strategies, reflecting evolutionary and psychological mechanisms that influence interpersonal dynamics and reproductive behavior. Through the course of this work, several psychometrically validated questionnaires were developed in Hungarian, designed to measure key constructs, such as sociosexuality, sexual motivation, love styles, and types rooted in the three-component theory of love, the functioning of sexual systems, openness to sugar relationships, and motivations behind women's faking orgasm.

The integration of the three-component theory of love into this study provides a nuanced framework for understanding how intimacy, passion, and commitment interact to shape diverse love styles and relational patterns. By examining these components, alongside sexual motivation and sociosexuality, this study contributes to a richer understanding of how individual differences and contextual factors influence romantic and sexual relationships.

The studies presented in this thesis reflect a broad scope of inquiry encompassing three major areas within evolutionary and sexual psychology: (1) individual differences in sexual motivation, (2) psychological correlates of openness to sugar relationships, and (3) women's motivations for faking an orgasm. Across the 16 studies presented in this dissertation, 94,396 participant responses were analyzed, providing a robust dataset that enhances the reliability and validity of the findings, as larger sample sizes are crucial for ensuring statistical power and generalizability in psychological research (Krosnick, 1999; Lakens, 2022). These investigations relied on the sexual motivation questionnaire as a core tool in two-thirds of the surveys, underscoring its importance in capturing the multifaceted nature of human mating behaviors. Table 2 and the following section provide a detailed summary of these studies and their contributions to the field.

The following sections provide a concise summary of the studies included in this dissertation, highlighting their unique contributions to understanding human mating strategies, sexual motivation, and relationship dynamics. Each chapter delves into a distinct aspect of these topics, ranging from the psychometric development of new measurement tools to the exploration of specific psychological phenomena such as sociosexuality, openness to sugar relationships, and the motivations behind women's faking orgasm.

Table 2 *Summary of the Studies Presented in the Thesis*

Chapter	Topic	Output
2	**Individual differences in sexual motivation**	
2.1	Sex- and age-related associations of uncommitted sociosexuality	Hungarian version of the Revised Sociosexual Orientation Inventory (SOI-R)
2.2	Sex- and age-related associations of sexual motivations and their correlations with personality and sociosexuality	Hungarian version (short form) of the Reasons for Having Sex Questionnaire (YSEX?-HSF)
2.3	Sex and age-related associations of sexual motivation, adult attachment, and sexual system functioning	Brief (15-item) Hungarian version of the Reasons for Having Sex Questionnaire (YSEX?-15H)
2.4	Sex and relationship differences in romantic love	Hungarian version of the Short Love Attitude Scale (LAS-SF)
2.5	Sex differences in predictors of relationship satisfaction	Cross-sectional analysis of the effects of dyadic coping, romantic love, sexual motivation, and having children on subjective relationship satisfaction
2.6	Sex and age differences in sexual motivation	Sex- and age-specific analysis of links between sexual motivation, emotion regulation, and dyadic coping
2.7	Cross-cultural study of intrasexual competition	Cross-sectional analysis of links between mating competition, aggression, appearance enhancement, and sexuality in three countries
3	**Exchanges of sex for resources in human mating**	
3.1	Individual differences in attitudes towards sex-for-resources encounters among younger people	Acceptance of Sugar Relationships in Young Women and Men Scale (ASR-YWMS)
3.2	Individual differences in attitudes towards sex-for-resources encounters among older people	Acceptance of Sugar Relationships in Older Men and Women Scale (ASR-OMSW)
3.3	Differences between age groups in openness to sex-for-resources encounters	Cross-sectional analysis of links between openness to sugar relationships, adult attachment, motivation, and self-esteem
3.4	Global study of exchanges of sex for resources across 87 countries	Analysis of links between attitudes towards sugar relationships and individual-level and country-level variables
3.5	The impact of early childhood experiences on openness to sex-for-resources encounters	Analysis of associations between life history strategy and openness to sugar relationships
4	**Women's faking orgasm**	
4.1	Individual differences between self-reported faking orgasm, sexual motivation, and sexual working models	Hungarian version and abridgement of the Faking Orgasm Scale for women
4.2	Individual differences between self-reported faking orgasm and adult attachment	Analysis of associations between dimensions of adult attachment and motivation for faking orgasm among women
4.3	Individual differences between self-reported faking orgasm and emotion regulation	Analysis of links between women's faking orgasm, sexual motivation, and emotion regulation difficulties
4.4	Individual differences between faking orgasm, sociosexuality, relationship satisfaction, and mate retention	Analysis of links between women's faking orgasm, sociosexuality, relationship satisfaction, and mate retention

Contributions to the 'Individual differences in sexual motivation' topic

The study presented in **Chapter 2.1** (Meskó et al., 2014) explores the validation and adaptation of the Revised Sociosexual Orientation Inventory (SOI-R) into Hungarian. This inventory is widely used in evolutionary psychology to measure sociosexual orientation, reflecting individuals' willingness to engage in uncommitted sexual relationships. This study aimed to evaluate the factor structure and psychometric properties of the Hungarian version and to analyze sex and age differences in sociosexuality.

This study involved 1,345 Hungarian participants (832 women and 513 men) aged 16–74 years (M = 26.37, SD = 8.75). Participants completed the Hungarian version of the SOI-R, which consists of three subscales: sociosexual behavior, sociosexual attitude, and sociosexual desire. Data were collected via online platforms, and psychometric analysis included exploratory and confirmatory factor analyses (EFA and CFA) to validate the inventory's three-factor structure. Reliability was assessed using Cronbach's alpha, while sex and age differences were analyzed using ANOVA and correlation tests.

The results confirmed that the Hungarian version of the SOI-R retains the original three-factor structure (behavior, attitude, and desire) proposed by Penke and Asendorpf (2008). The inventory demonstrated strong internal consistency, with Cronbach's alpha values exceeding .80 for all subscales. Men scored higher than women on all subscales and the global sociosexuality index, which is consistent with findings from previous studies.

Age had differential effects on the three subscales. Sociosexual behavior was positively correlated with age, indicating that older participants were more likely to report uncommitted sexual behavior over their lifetime. Conversely, sociosexual desire decreases with age, reflecting the natural decline in sexual drive due to physiological factors such as reduced testosterone levels. Interestingly, sociosexual attitudes remained unaffected by age, suggesting that attitudes toward uncommitted sexual relationships are less influenced by developmental changes and are more shaped by cultural and social factors.

These findings support evolutionary theories of sexual strategies and parental investment, which suggest inherent sex differences in sociosexuality due to the varying reproductive costs faced by men and women. Men's higher sociosexuality scores are consistent with their evolved inclination toward short-term mating strategies to maximize reproductive success. Women's more restricted sociosexuality aligns with their greater parental investment, favoring selective mate choice and long-term commitment.

This study also sheds light on the life-span developmental dynamics of sociosexuality. While older adults engage in unrestricted sexual behavior due to accumulated life experiences, their declining desire reflects age-related physiological changes. The stability of sociosexual attitudes across age groups highlights the influence of socialization and cultural norms on individual developmental trajectories.

The Hungarian version of the SOI-R is a reliable and valid instrument for studying sociosexual orientation, offering valuable insights into individual differences in sexual behavior, attitudes, and desires. These findings can inform future research in evolutionary psychology, sexual health, and relationship counseling. Moreover, the inventory's robust psychometric properties make it a suitable tool for cross-cultural comparisons and clinical applications, particularly for marital and sex therapy.

This study successfully validated the Hungarian version of the SOI-R, confirming its three-factor structure and applicability for examining sociosexuality in diverse contexts. The observed sex and age differences align with evolutionary predictions, providing a comprehensive understanding of sociosexual orientation as a complex interplay between biological, psychological, and cultural factors. These findings pave the way for further exploration of sociosexuality in Hungarian and broader cultural contexts.

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The study presented in **Chapter 2.2** (Meskó et al., 2022) investigated the validation of the Hungarian version of the YSEX? questionnaire (YSEX?-HSF), a tool designed to explore the diverse motivations behind sexual activity. This research adapted the methodology of Meston and Buss (2007) to a Hungarian cultural context, aiming to uncover unique patterns of sexual motivation within this population.

This study was conducted in three phases. In the first phase (Study 1), a large Hungarian sample of 2,728 participants (1,069 women and 1,659 men) was surveyed to determine the reasons for engaging in sexual activity. The participants provided free responses, which were refined into a list of 197 distinct reasons. The second phase (Study 2) involved a separate sample of 1,161 participants (820 women and 341 men) who rated the frequency of these reasons in their own sexual experiences. Factor analyses of the responses identified three primary dimensions of sexual motivation: Personal Goal Attainment, Relational Reasons, and Sex as Coping. In the final phase (Study 3), the team developed a short questionnaire (YSEX?-HSF) using data from a third sample of 1,024 participants (578 women and 446 men). The short-form retained 73 items and demonstrated high reliability and validity.

The Hungarian version of the YSEX?-HSF revealed a distinct factor structure compared to the original four-factor model, consolidating motivations into three broader categories. Despite these structural differences, many items showed cultural and content overlap with the original, highlighting both the universal and culturally specific aspects of sexual motivation.

This study found significant gender differences in sexual motivation. Men scored higher on Personal Goal Attainment, particularly for motives related to novelty seeking, infidelity, and impulsiveness, while women scored higher on Sex as Coping, reflecting a stronger emphasis on relational dynamics, such as commitment and mate retention. Interestingly, no significant gender differences were observed in relational reasoning. However, subfactor analyses revealed that women scored higher on motives that emphasized intimacy and care, whereas men were more motivated by physical attraction.

Age also plays an important role in shaping sexual motivations. Younger participants endorsed a wider variety of reasons for engaging in sexual activity than older participants. Motivations associated with personal goals, such as novelty and sensation seeking, were more pronounced in younger age groups, whereas relational reasons, such as commitment, diminished with age.

Personality traits and sociosexuality further influenced motivation. Openness to new experiences was positively correlated with all three dimensions of sexual motivation, suggesting that individuals with higher openness engage in sexual activities for diverse reasons. Extraversion was linked to both personal goal attainment and relational reasoning, indicating that extraverted individuals may find sexual activities rewarding both for their personal goals and fostering relational bonds. In contrast, agreeableness and conscientiousness were negatively associated with Personal Goal Attainment, supporting prior research linking these traits to greater self-regulation and a lower likelihood of infidelity.

These findings highlight the cultural, gender, and age-specific factors that influence sexual motivation. While men and women share common motivations, such as love and mutual attraction, significant differences have emerged in their triggers and specific goals. Men’s motivations often reflect short-term mating strategies, including novelty seeking and impulsiveness, aligning with evolutionary theories of maximizing reproductive opportunities. Women’s motivations, on the other hand, emphasized emotional security and relational maintenance, suggesting a stronger alignment with long-term mating strategies.

This study also underscores the adaptive nature of sexual motivation as part of broader mating strategies shaped by sociocultural and individual psychological factors. The distinct

three-factor structure observed in the Hungarian context suggests that cultural influences play a significant role in shaping specific dimensions of sexual motivation.

The Hungarian version of the YSEX? questionnaire (YSEX?-HSF) successfully captures the complexity of sexual motivations in a culturally specific context. This study contributes to a deeper understanding of human sexual behavior, highlighting the interplay between universal and culture-specific patterns of sexual motivation. The YSEX?-HSF provides a robust tool for cross-cultural research and offers valuable insights into the psychological and relational factors driving sexual activity.

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The study presented in **Chapter 2.3** (Meskó et al., 2022b) focused on the development and validation of the YSEX?-15H, a 15-item brief version of the YSEX?-HSF questionnaire was designed to measure three primary dimensions of sexual motivation: personal goal attainment, relational reasoning, and sex as coping. Compared to the original 73-item version, this tool allows for a faster and more accessible assessment, while maintaining psychometric quality and validity.

The study included eight separate samples, comprising 6,193 participants (1,976 men and 4,217 women). Data were collected through online questionnaires that measured constructs such as sociosexuality (SOI-R), the Big Five personality traits (BFI-S), and attachment styles (ECR-S, ASQ-H). The item reduction process employs redundancy analysis and item-response theory (IRT) to identify the most informative items for each dimension. From the YSEX?-HSF, the five most informative items were selected for each of the three dimensions, ensuring the reliability and validity of the short version.

The YSEX?-15H demonstrated a high correlation with the original YSEX?-HSF scales, indicating that the short version effectively measured the three primary dimensions of sexual motivation. The internal consistency was excellent, with McDonald's omega values ranging between 0.73 and 0.79. Psychometric evaluations confirmed that the short version provides reliable measurements across a broad spectrum of sexual motivations.

Men scored significantly higher than women on the Personal Goal Attainment dimension, reflecting greater motivation for self-focused goals, such as novelty seeking and impulsiveness. Women scored higher on the relational reasoning dimension, indicating a stronger emphasis on emotional connections and partner-focused goals. Although women also scored higher on the Sex as Coping dimension, the gender difference was statistically less pronounced. These results align with previous findings suggesting that men are more often motivated by self-focused

goals, whereas women are more likely to engage in sexual activity for emotional or relational reasons.

Age-related patterns showed that younger participants scored higher on the Relational Reasons dimension, suggesting that relational goals were more prominent in early adulthood. Conversely, older participants scored higher on the Personal Goal Attainment dimension, reflecting a more self-focused approach to sexual activity later in life.

The YSEX?-15H scales were moderately correlated with attachment styles and sociosexuality. The Personal Goal Attainment dimension was more strongly associated with sexual hyperactivation and avoidant attachment strategies, while the relational reasoning dimension was correlated with secure attachment. Sex as Coping dimension was correlated with sexual hyperactivation and insecure attachment patterns, supporting the notion that such motivations are closely tied to emotional and relational challenges.

The YSEX?-15H is a reliable and valid short questionnaire that effectively measures the three primary dimensions of sexual motivation. Its brevity makes it particularly suitable for large-scale studies and clinical settings where quick assessments of sexual motivation are required. This tool not only facilitates the understanding of fundamental sexual motivations but also contributes to research and therapeutic interventions related to sexual behavior.

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The study presented in **Chapter 2.4** (Meskó et al., 2021) discusses the adaptation and validation of the Short Love Attitude Scale (LAS-SF) for Hungarian use. The original factor structure was replicated in a Hungarian sample of 800 participants (439 women; mean age: 38.6 years), demonstrating that the LAS-SF is both reliable and valid. This study aimed to explore differences in love styles based on gender, age, and relationship status using the LAS-SF.

The LAS-SF comprises 24 items measuring six love styles: Eros (passionate love), Ludus (playful love), Storge (friendly love), Pragma (practical love), Mania (dependent, obsessive love), and Agape (selfless love). Participants rated their agreement with the items on a 5-point Likert scale, assessing their affinity for different love styles. The study employed online questionnaires and included related instruments such as the Sociosexual Orientation Inventory (SOI-R) and the Hungarian Short Form of Reasons for Having Sex Questionnaire (YSEX?-HSF).

The results confirmed that the original six-factor model of the LAS-SF fits the Hungarian sample well. The Eros subscale had a Cronbach's alpha of 0.82, Ludus 0.77, Storge 0.87, Pragma 0.64, Mania 0.73, and Agape 0.83. Correlations among love styles, sociosexuality, and sexual motivation were generally moderate, with stronger relationships observed for Eros and Ludus.

Men scored significantly higher on the Ludus scale, while women scored higher on the Eros, Storge, Pragma, and Mania scales. No sex differences were found in Agape. Sex differences in Ludus were most pronounced among singles and in long-term relationships or marriages. Women seeking short-term relationships had Ludus scores that were comparable to those of men.

Eros was most strongly endorsed by those in relationships, particularly among married participants, whereas Ludus scores were higher among those seeking short-term relationships. Mania scores were lower among married individuals than among single or long-term relationships.

Age showed a weak but significant correlation with Eros (negative) and Ludus (positive). This suggests that older participants were less passionate but more playful in their approach to relationships.

The Hungarian version of the LAS-SF is a reliable and valid instrument for studying love styles and their differences by gender, age, and relationship status. The findings confirm that love styles are closely linked to mating strategies and sociocultural contexts that shape individuals' attitudes and behaviors in relationships. The LAS-SF is a valuable tool for research on relationship dynamics and therapeutic interventions.

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The study presented in **Chapter 2.5** (Meskó et al., 2022c) investigated sex differences in relationship satisfaction, focusing on the effects of dyadic coping, components of love, sexual motivation, and parenthood. The aim of this study was to explore how these factors influence relationship satisfaction in men and women and whether their impact differs by gender.

The study involved 465 Hungarian adults, 68.6% of whom were women (319 participants) and 31.4% were men (146 participants), with ages ranging from 18 to 72 years (mean age: 30.4 years). Of the participants, 94% were in stable relationships, while 6% were single or casual relationships. Data were collected using online self-reporting questionnaires. Relationship satisfaction was assessed using the RAS-H (Hungarian Relationship Satisfaction Scale), which provides a comprehensive evaluation of relationship quality. Dyadic coping strategies, including both positive and negative coping, were measured using the DCI (Dyadic Coping Inventory). The Sternberg Triangular Love Scale (STLS) was used to measure the three components of love (intimacy, passion, and commitment). Sexual motivations were assessed using the Hungarian Short Form of the Reasons for Having Sex Questionnaire (YSEX?-HSF). YSEX?-HSF examines three dimensions of sexual motivation: personal goal attainment,

relational reasons, and sex as coping. Statistical analyses were based on linear regression models applied separately for men and women to identify the predictors of relationship satisfaction.

For men, relationship satisfaction was most positively influenced by intimacy and passion, whereas negative dyadic coping and parenthood negatively affected satisfaction. For women, intimacy, passion, commitment, and positive dyadic coping all positively contributed to satisfaction, whereas sex as coping, their own dyadic coping strategies, and negative dyadic coping were negative predictors. The findings showed that intimacy was a stronger predictor of satisfaction for men than for women, and the negative impact of parenthood was also more pronounced for men. Conversely, commitment and positive dyadic coping had a stronger positive impact on women's satisfaction, while sex as coping had a more negative effect on women than men.

The results indicated that women's relationship satisfaction is grounded in more complex psychological dynamics than that of men, as evidenced by the greater number of predictive factors. Partner support and positive relationship dynamics significantly influence women's satisfaction, whereas men's satisfaction is more strongly associated with intimacy and passion. The findings align with evolutionary psychological theories, which propose that men's and women's different relational strategies are rooted in distinct psychological needs and reproductive challenges. The study also highlighted the importance of a shared sense of "we-ness," which reflects mutual goals and responsibilities, as a critical factor in managing common stressors, such as parenting.

This study identified significant gender differences in the factors influencing relationship satisfaction, emphasizing the role of positive dyadic coping and intimacy in the success of long-term relationships. These findings have practical implications for relationship counseling, particularly in addressing the differing needs and preferences of men and women. This study contributes to a deeper understanding of relationship dynamics and provides a foundation for developing more effective strategies to enhance relationship satisfaction.

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The study presented in **Chapter 2.6** (Meskó et al., 2025a) investigated the relationships among sexual motivation, difficulties in emotion regulation, and dyadic coping (DC), focusing on how these associations vary with sex and age. This study highlights the complexity of these interactions and sheds light on how individual differences in these psychological constructs influence sexual behaviors and relational dynamics.

The study involved over 500 Hungarian adults, most of whom had stable relationships. Participants completed online self-report surveys, including the Hungarian Short Form of the

Reasons for Having Sex Questionnaire (YSEX?-HSF), the Difficulties in Emotion Regulation Scale (DERS), and the Dyadic Coping Inventory (DCI). Statistical analyses used Generalized Linear Mixed Models (GLMMs) to explore patterns and interactions across different age groups and between men and women.

The findings revealed that self-centered sexual motivation was strongly associated with overall emotion dysregulation, particularly among men. Men who reported greater difficulties with impulse control and limited emotion regulation strategies were more likely to exhibit self-centered sexual motivations, suggesting that they may use sexual activity as a means to cope with negative emotions. Interestingly, age did not significantly predict self-centered sexual motivation, contradicting expectations that such motivations would decrease as individuals grow older.

Relationship-oriented sexual motivation showed a negative association with age, indicating that older individuals tend to prioritize these motives less than younger adults. Difficulties in emotion regulation also influenced relationship-oriented motivations. For instance, a lack of emotional awareness negatively affected relational motives, whereas impulse control difficulties showed a positive association with these motivations. This pattern suggests that individuals with specific emotion regulation challenges may still strive to maintain relational goals through sexual activity, albeit in complex and sometimes conflicting ways.

Coping-related sexual motivation displayed distinct patterns between sexes. Women's coping-related motivations were influenced more by difficulties with emotional awareness, while men's coping-related motivations were linked to the non-acceptance of emotions and challenges with impulse control. Unlike other motivational dimensions, coping-related sexual motivation did not exhibit significant changes with age nor did it consistently correlate with dyadic coping strategies.

Negative dyadic coping responses were associated with increased coping-related sexual motivation in both men and women. This finding suggests that unresolved relational stress may prompt individuals to use sex as a coping mechanism in their relationships. Conversely, relationship-oriented sexual motivation showed a positive association with supportive dyadic coping behaviors, particularly in men, highlighting the potential role of mutual support and shared emotional regulation in fostering relational motives.

This study underscores the nuanced interplay between sexual motivations and emotional and relational processes, revealing distinct patterns based on sex and age. Men were more likely to engage in self-centered sexual activities as a means of mitigating emotional dysregulation, while women's coping-related motivations were influenced by a broader range of emotional

challenges. The findings also highlight an age-related trend, with older adults showing a reduced emphasis on relationship-oriented motives, suggesting a potential shift in the functional role of sexual activity across their lifespan.

These results underscore the importance of considering individual and relational contexts when examining sexual motivation and its psychological underpinnings. The interplay between dyadic coping and sexual motivation further emphasizes the role of relational dynamics in shaping sexual behaviors. While negative dyadic coping appears to drive coping-related motivations, supportive coping strategies seem to bolster relationship-oriented motives, particularly among men.

This study provides valuable insights into the adaptive functions of sexual motivation as a part of broader emotional and relational strategies. This highlights the critical roles of age, sex, and emotional dynamics in shaping sexual behavior and relational coping mechanisms. These findings contribute to a deeper understanding of the complex psychological processes underlying sexual motivation and their implications for relationship satisfaction and emotional well-being.

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The study presented in **Chapter 2.7** (Meskó et al., 2025b) provides a comprehensive cross-cultural analysis of intrasexual competition and its associations with psychological constructs, such as sensation seeking, aggression, appearance enhancement behaviors, openness to cosmetic surgery, sexual motivation, and sociosexuality. This research focused on three culturally distinct countries—Canada, Hungary, and Indonesia—to explore both individual and cultural differences in intrasexual competition.

This study surveyed 661 participants, including individuals from Canada, Hungary, and Indonesia, with diverse demographic and cultural backgrounds. The participants completed an online questionnaire that included validated scales to measure intrasexual competition, sensation-seeking, aggression, beauty-enhancing behavior, openness to cosmetic surgery, sexual motivation, and sociosexual orientation. The researchers employed Bayesian multilevel modeling to examine the associations between intrasexual competition and psychological variables. Additionally, measurement invariance testing ensured that the instruments were reliable and valid across different cultural and linguistic groups.

The results highlighted significant positive correlations between intrasexual competition and all the examined psychological constructs. Specifically, superiority enjoyment, a subcomponent of intrasexual competition, was strongly linked to sensation seeking, beauty-enhancing behavior, and all facets of openness to cosmetic surgery. Similarly, inferiority frustration,

another subcomponent, was associated with sociosexuality and relational sexual motives. These findings align with those of previous research but also offer novel insights into the dynamics of intrasexual rivalry.

Aggression showed a consistent positive association with intrasexual competition, particularly physical and verbal aggression. This supports the idea that aggressive behaviors can serve as strategies in mate competition, particularly in environments in which resources or potential mates are perceived as scarce.

Cultural differences emerged in intrasexual competition patterns. While there were no significant differences between Canada, Hungary, and Indonesia in terms of superiority enjoyment, Canadians exhibited lower levels of inferiority frustration than the other two groups. This finding suggests that cultural norms and societal values significantly influence intrasexual competition.

Sexual motivation plays a central role in intrasexual competition. Personal goal attainment motives, relational reasons, and using sex as a coping mechanism were positively associated with intrasexual competition, highlighting the multifaceted nature of sexual drives in competitive mating contexts.

Sociosexuality, particularly unrestricted sexual attitudes and desires, also demonstrates a strong positive correlation with intrasexual competition. This association suggests that individuals with a more open attitude toward casual sexual relationships are more likely to engage in competitive behaviors to attract or retain their mates.

This study underscores the complexity of intrasexual competition and its interplay with individual and cultural variables. While evolutionary theories provide a foundational understanding of mate competition, this study expands on these theories by examining the influence of psychological constructs and cultural contexts. The results indicate that intrasexual competition is not a uniform phenomenon but is shaped by both personal characteristics and the sociocultural environment.

These findings also have practical implications for understanding the psychological underpinnings of human mating strategies. They suggest that individuals engage in competitive behaviors not only to secure potential mates but also to enhance their social and emotional standing within their peer groups. Furthermore, the cross-cultural differences observed in this study highlight the need for culturally sensitive approaches when studying mating behaviors in humans.

This chapter contributes to the growing body of research on intrasexual competition by providing a nuanced cross-cultural perspective. The associations identified between intrasexual

competition and sensation seeking, aggression, beauty-enhancing behaviors, and sociosexuality emphasize the diverse strategies that individuals employ in the pursuit of reproductive success. By incorporating cultural dimensions into the analysis, this study offers a richer understanding of how environmental and societal factors influence the expression of competitive behaviors in human mating.

Contributions to the 'Openness to sugar relationships' topic

The study presented in **Chapter 3.1** (Birkás et al., 2020) focused on the development and validation of the Acceptance of Sugar Relationships in Young Women and Men Scale (ASR-YWMS), a novel instrument designed to measure attitudes toward sugar relationships. These relationships are transactional sexual arrangements, in which companionship or sexual services are exchanged for material compensation. This study aimed to create a reliable and valid scale capable of capturing attitudes toward such relationships among young women and men and to explore the psychological and personality factors underlying these attitudes.

The research involved two independent online studies with a total of 2,052 participants (1,879 women and 173 men) aged 18–28 years. The development process of the ASR-YWMS included multiple iterations to ensure the scale's internal consistency and psychometric validity. Along with demographic data, participants completed a variety of psychological questionnaires assessing relational attitudes, sexual motivations, love styles, and personality traits.

The results showed that the ASR-YWMS was a reliable and valid instrument. Openness to sugar relationships (high scores on the ASR-YWMS) strongly correlates with relational attitudes, such as a preference for short-term relationships and self-centered sexual motivations. Acceptance of sugar relationships was closely linked to the Ludus love style, which emphasizes a manipulative and playful approach to relationships, and was negatively correlated with the Eros love style, which focuses on romantic and emotional attachment.

This study highlighted the role of personality traits in shaping attitudes toward sugar relationships. It revealed that acceptance of such relationships was associated with socially aversive traits such as Machiavellianism, subclinical psychopathy, and borderline personality organization. These traits share the common theme of manipulative and resource-maximizing approaches, which are reflected in individuals' relationship strategies. The psychological motivations underlying these attitudes, including self-centered sexual motivations and manipulative relational strategies, suggest that openness to sugar relationships is part of a broader utilitarian mating strategy.

The study also pointed out that positive attitudes toward sugar relationships reflect a risk-taking and exploitative outlook that fundamentally influences individuals' psychological and sexual functioning in intimate relationships. These findings suggest that the ASR-YWMS is a versatile tool for further examining the psychological, social, and cultural aspects of sugar relationships, offering opportunities to deepen our understanding of the connections between relational attitudes, love styles, and personality traits.

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The study presented in **Chapter 3.2** (Láng et al., 2021) focused on the development and validation of the Acceptance of Sugar Relationships in Older Men and Women Scale (ASR-OMWS), an instrument designed to measure attitudes toward sugar relationships among older adults. This study builds on previous research conducted on young adults (Birkás et al., 2020), which examined the attitudes of those providing companionship in sugar relationships. The ASR-OMWS shifts its focus to older adults who act as resource providers, offering financial or material benefits in exchange for companionship or sexual relations.

The development of the ASR-OMWS involved two online studies with a combined sample of 836 participants (277 women and 559 men) aged 40–71 years. In the first study (N = 481), participants completed questionnaires on sociosexuality, love attitudes, and sexual motivations. In the second study (N = 355), the researchers assessed personality traits, including the Dark Triad traits (Machiavellianism, Narcissism, and Psychopathy) and Borderline Personality Organization (BPO). The findings demonstrate that the ASR-OMWS has excellent psychometric properties, establishing it as a reliable and valid tool.

The results indicated that older adults who were more open to sugar relationships tended to exhibit less restricted sociosexuality, a preference for the Ludus love style (characterized by a playful and manipulative approach to relationships), and self-centered sexual motivations. These individuals showed a negative association with the Eros love style, which focuses on romantic and emotional intimacy. This pattern reflects an instrumental approach to relationships, in which sexuality and intimacy are often viewed as tools for achieving personal or material gains.

The study also examined the role of personality traits in shaping attitudes toward sugar relationships. It was found that the Dark Triad traits and borderline personality organization were moderately and positively associated with the acceptance of sugar relationships. These traits suggest a predisposition toward short-term, low-commitment relational strategies, aligning with utilitarian and opportunistic approaches.

From an evolutionary perspective, the findings suggest that older adults who engage in sugar relationships adaptively respond to age-related declines in romantic market value. For these individuals, the values of intimacy and social prestige become more prominent, particularly among those who place less emphasis on romantic or emotionally committed relationships.

This research underscores the complex dynamics underlying attitudes toward sugar relationships, highlighting the interconnected roles of individual personality traits, sexual motivations, and relational attitudes. These findings provide a deeper understanding of relational strategies among older adults and represent a significant step toward understanding the psychological foundations of such relationships.

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The study presented in **Chapter 3.3** (Ipolyi et al., 2021) focused on the role of attachment avoidance in moderating the relationships among acceptance of sugar relationships, motivation, and self-esteem. This study aimed to explore the psychological correlates of sugar relationship acceptance by examining intrinsic and extrinsic motivations, attachment styles (avoidance and anxiety), and self-esteem in younger and older individuals.

This study involved 2,409 Hungarian adults, comprising a younger subsample of 1,980 participants (1,804 women and 175 men, mean age = 21.17) and an older subsample of 429 participants (290 men and 138 women, mean age = 48.86). Participants completed an online survey that included validated measures of sugar relationship acceptance (ASR-YWMS for younger individuals and ASR-OMWS for older individuals), Rosenberg Self-Esteem Scale, Aspirations Index, and ECR-RS scale assessing attachment avoidance and anxiety.

The findings revealed significant age-related differences in the factors associated with acceptance of sugar relationships. Among younger participants, sugar relationship acceptance showed a notable positive correlation with extrinsic motivation, reflecting a focus on external rewards, such as financial and social benefits. However, intrinsic motivation and self-esteem were weakly or negatively associated with the acceptance of sugar relationships. For older participants, sugar relationship acceptance was positively correlated with extrinsic motivation, attachment avoidance, and attachment anxiety, whereas intrinsic motivation showed a negative association. Self-esteem did not significantly predict sugar relationship acceptance in this group.

Moderation analyses highlighted the critical role of attachment avoidance in shaping the relationship between psychological variables and acceptance of sugar relationships. In younger participants, higher levels of attachment avoidance weakened the negative effects of self-esteem and intrinsic motivation on acceptance of the sugar relationship. This suggests that, for

individuals with avoidant attachment tendencies, the focus shifts away from intrinsic values and self-esteem toward external rewards, potentially aligning with a preference for transactional relationships.

Among the older participants, attachment avoidance moderated the positive relationship between extrinsic motivation and acceptance of sugar relationships. Specifically, as attachment avoidance increased, the strength of the association between extrinsic motivation and acceptance of the sugar relationship decreased. This indicates that, while older individuals with low attachment avoidance may pursue sugar relationships to achieve social goals or enhance their public image, those with high attachment avoidance may prioritize material gains over relational investments.

This study contributes to the literature on adult attachment and romantic relationships by demonstrating how attachment orientation influences the acceptance of sugar relationships across different age groups. The results suggest that individuals with higher attachment avoidance are more likely to engage in sugar relationships driven by external motivations and a preference for emotionally detached connections. Moreover, the findings underline the importance of understanding age-specific dynamics in the interplay between attachment, motivation, and self-esteem in shaping attitudes toward transactional relationships.

These insights provide a nuanced understanding of how individual differences in attachment and motivational orientations influence the acceptance of sugar relationships, offering a foundation for future research examining cultural and contextual variations in these dynamics.

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The study presented in **Chapter 3.4** (Meskó et al., 2024) provides a comprehensive cross-cultural analysis of attitudes toward sugar relationships and explores the dynamics of exchanging resources for sex and companionship across 87 countries. This global study aimed to identify the psychological, social, and cultural predictors of openness to sugar relationships using two psychometric tools: the Acceptance of Sugar Relationships in Young Women and Men Scale (ASR-YWMS) and the Acceptance of Sugar Relationships in Older Men and Women Scale (ASR-OMWS). Both scales were adapted and validated in 37 languages to ensure their cross-linguistic applicability.

The study included 69,924 participants, covering a diverse demographic range in terms of age, sex, and relationship status. The analysis focused on individual-level predictors (e.g., sociosexual orientation, traditional gender roles, pathogen history) and country-level factors (e.g., gender inequality, Human Development Index, collectivism) to assess their relationship with attitudes toward sugar relationships.

The results highlight significant individual-level predictors. Unrestricted sociosexual orientation and adherence to traditional gender roles were positively associated with openness to sugar relationships, whereas pathogen history was a less consistent predictor. Interestingly, younger participants demonstrated higher openness to sugar relationships, aligning with the hypothesis that age is correlated with mating strategies.

At the country level, higher gender inequality and greater parasite stress positively predicted openness to sugar relationships, supporting the notion that societal and environmental pressures shape attitudes toward transactional relationships. Conversely, countries with higher Human Development Index (HDI) scores exhibited lower acceptance of sugar relationships, suggesting that economic stability reduces reliance on such exchanges.

This study also revealed notable cross-cultural and regional variation. In Northern Africa and Western Asia, the ASR-OMWS scores were higher than the ASR-YWMS scores, reflecting the sociocultural emphasis on traditional gender roles and economic dependence in these regions. By contrast, participants from Northern and Western Europe reported lower scores on both scales, indicating greater gender equality and individualistic values in these societies.

The researchers employed advanced statistical techniques such as multilevel modeling and cross-linguistic measurement invariance testing to ensure the validity and reliability of the scales across diverse cultural contexts. These methods confirmed the robustness of ASR-YWMS and ASR-OMWS as tools for cross-cultural comparisons.

This study underscores the complex interplay between individual characteristics, cultural norms, and environmental factors in shaping attitudes toward sugar relationships. By integrating psychological and sociocultural perspectives, these findings offer valuable insights into how global and regional differences influence mating strategies. Furthermore, this study highlights the potential of sugar relationships as an adaptive strategy in the context of economic and social inequality, particularly among women in patriarchal societies.

In conclusion, this cross-cultural investigation provides a nuanced understanding of sugar relationships, emphasizing their multidimensional nature and the importance of considering both individual and societal factors when studying human mating strategies. These results pave the way for future research on the implications of transactional relationships in diverse cultural and socioeconomic contexts.

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The study presented in **Chapter 3.5** (Meskó et al., 2025c) explored the relationship between openness to sugar relationships and life history strategies, focusing on how early life experiences and environmental conditions shape adult attitudes toward transactional sexual

exchanges. Using Life History Theory (LHT) as a theoretical framework, this study aimed to clarify whether sugar relationships are better understood as part of short- or long-term mating strategies or whether they are primarily associated with individual differences in mating orientation.

A total of 312 participants (192 women and 120 men) completed an online questionnaire assessing the key constructs related to mating strategy and developmental history. These included the Acceptance of Sugar Relationships in Young Women and Men Scale (ASR-YWMS), High-K Strategy Scale (HKSS), Multidimensional Measure of Sociosexual Orientation (MMSO), and validated measures of childhood family harshness, unpredictability, and perceived vulnerability to infectious diseases. Statistical analyses were conducted using both general linear models and structural equation modeling (SEM) to test a theoretically grounded predictive model.

The results revealed that the strongest predictor of openness to sugar relationships was short-term mating orientation (STMO), while life history strategy, although statistically significant in women, played a secondary role. For women, higher ASR scores were associated with higher STMO and lower HKSS scores, indicating a tendency toward faster life history strategies. However, among men, ASR was predicted exclusively by short-term mating orientation, with no significant associations found for life-history indicators.

A notable indirect pathway emerged among women: lower levels of family resources during childhood predicted a faster life history strategy, which, in turn, was linked to greater openness to sugar relationships. However, childhood unpredictability did not show significant direct or indirect effects in either gender. These results point to a selective developmental mechanism in which early material deprivation, rather than environmental instability per se, may foster relational attitudes centered around immediate resource gains.

The analysis of sociosexuality reinforces this interpretation. Openness to sugar relationships was positively associated with unrestricted sociosexuality, particularly in the short-term mating orientation dimension. Long-term mating orientation (LTMO) showed a negative association with ASR only descriptively, and this effect was not statistically significant. These findings suggest that sugar relationships are more closely aligned with short-term relational motives than with broader reproductive strategies, as defined by life-history theory.

Although theoretical models and previous research have suggested possible sex differences in how early environmental cues and developmental strategies influence mating preferences, the present study did not find any significant sex interactions. This indicates that, while

descriptive patterns may differ, the underlying psychological predictors of openness to sugar relationships operate similarly across sexes when controlling for key covariates.

Taken together, the findings suggest that openness to sugar relationships reflect a psychologically meaningful orientation toward short-term resource-based exchanges rather than a direct expression of broader life history strategies. Among women, early life scarcity appears to play an indirect role via a fast life history strategy, but the dominant influence across sexes remains sociosexuality. This study contributes to the understanding of how individual differences in mating motives, shaped by both developmental history and dispositional factors, influence adult relational preferences in the context of transactional intimacy.

Contributions to the 'Women's faking orgasm' topic

The study presented in **Chapter 4.1** (Csányi et al. 2024) focused on the psychological underpinnings of faking orgasm among women by developing and validating the Faking Orgasm Scale for Women (FOS) Hungarian Short Form. The aim was to create a shorter, 24-item version of the original scale while preserving its ability to measure the four main dimensions and examine its validity in relation to various sexual motivations and behavioral patterns.

The study utilized two datasets: one with 2,220 women for scale reduction, and another with 768 women for validation purposes. Participants completed questionnaires assessing sexual functioning models, sexual motivations, and orgasm-faking behavior. The original 56-item FOS was shortened using Item Response Theory (IRT) analysis to identify optimal items representing the four subdimensions (for sexual intercourse and oral sex).

The analysis demonstrated that the FOS-24 retained the psychometric properties of the original scale, including its reliability and internal consistency. The shortened scale's subdimensions—Altruistic Deception, Fear and Insecurity, Enhanced Arousal, and Sexual Delay—showed strong correlations with the original version and were validated using a diverse Hungarian sample.

External validity analysis examined the relationships between the FOS-24, the Women's Sexual Working Models Scale (WSWMS), and the Short Form of the Sexual Motivation Questionnaire (YSEX?-HSF). Faking an orgasm was closely linked to the distancing dimension of the WSWMS, which reflects sexual detachment and emotional distance from one's partner and the act itself. Faking an orgasm most frequently appeared as a strategy to terminate sexual activity, especially when women perceived lower levels of partner care.

The motivations behind this faking orgasm reveal a complex interplay of factors. Regarding sexual motivations, personal goal attainment (e.g., boosting self-esteem) and stress

management strategies (e.g., reducing emotional deficits) were significantly associated with faking orgasm. Women who engaged in orgasm faking were more likely to use sex as a tool to manage their emotional struggles or avoid relational conflicts.

This study also highlighted that faking orgasm is often influenced by sociocultural pressures and expectations related to female sexuality. Sexual satisfaction was found to be strongly linked to honest communication and perceived partner care, whereas faking orgasm was more likely to be associated with decreased relationship and sexual satisfaction.

The FOS-24 is a reliable and valid tool that provides insight into the psychological factors underlying orgasm faking. The findings contribute to a deeper understanding of sexuality and relational dynamics, while offering practical implications for psychologists, therapists, and other healthcare professionals to better support women and couples.

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The study presented in **Chapter 4.2** (Láng et al., 2020) explored the relationship between dimensions of adult attachment and the motivation for faking orgasm in women. Using an attachment framework, this study investigates how attachment avoidance and anxiety are linked to women's reasons for pretending orgasm, particularly in romantic and sexual contexts.

This study included 348 women aged 18–59 years (M = 25.51; SD = 7.86) recruited through Hungarian women's health blogs. Participants completed an online survey that included the Faking Orgasm Scale for Women (FOS) and Experiences in Close Relationships Scale—Short Form (ECR-S). The FOS measured motivations for faking orgasm across two contexts: sexual intercourse and oral sex, whereas the ECR-S assessed two attachment dimensions: avoidance and anxiety.

The participants were asked to indicate whether they had ever faked an orgasm during sexual intercourse or oral sex. Multiple regression analyses and Pearson's correlations were used to test the relationship between attachment dimensions and motivation for faking orgasm, controlling for age.

Women with higher levels of attachment avoidance were more likely to fake orgasms to avoid negative emotions related to the absence of a real orgasm and end sexual activity quickly. Avoidant attachment was associated with the Sexual Adjournment (SISA) dimension during sexual intercourse and the Fear of Dysfunction (OSFD) dimension during oral sex, reflecting discomfort with intimacy and physical closeness.

Conversely, women with higher levels of attachment anxiety faked orgasm to enhance their partners' self-esteem (altruistic decline) and increase their own arousal (Elevated Arousal). Anxiously attached women were also more likely to fake orgasms to avoid embarrassment

during oral sex and to manage their partners' emotional needs. These behaviors align with the hyperactivating strategies of anxiously attached individuals, which aim to maintain closeness and prevent abandonment.

Age was a significant predictor of faking orgasms to end sexual intercourse, with older women more likely to report this motivation, highlighting a potential shift in sexual goals with age.

These findings support the hypothesis that adult attachment styles influence the motivation behind faking orgasms. Avoidant attachment is characterized by deactivation strategies that lead women to disengage from intimacy by pretending orgasm. In contrast, anxious attachment reflects hyperactivation, where women use fake orgasms as a tool to strengthen relational bonds and secure emotional closeness.

This study highlights the interplay between attachment insecurity and sexual behavior. Avoidant women prioritize detachment and self-preservation, often using fake orgasms to maintain emotional distance. Anxiously attached women, however, focus on partner-oriented strategies, such as boosting their partner's confidence or increasing perceived intimacy, to mitigate fears of rejection or abandonment.

This research contributes to the understanding of how attachment styles shape sexual decision making and relational dynamics. Clinicians working with women and couples can use these insights to address the emotional and psychological factors influencing sexual behaviors such as faking orgasms. Recognizing these patterns may help practitioners guide clients toward healthier relational and sexual communication, thereby enhancing overall relationship satisfaction.

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The study presented in **Chapter 4.3** (Meskó et al., 2025d) examined the role of emotion regulation difficulties and sexual motivations in women's reasons for faking orgasms during oral sex and sexual intercourse. This study aims to uncover the psychological mechanisms driving this behavior and how contextual differences influence their underlying motivations.

The study included 425 Hungarian women aged 18–80 years (M = 24.51, SD = 7.74). Participants completed an online survey comprising the Faking Orgasm Scale for Women (FOS), Difficulties in Emotion Regulation Scale (DERS), and Hungarian Short Form of the Reasons for Having Sex Questionnaire (YSEX?-HSF). Network analysis and general linear modeling (GLM) were applied to examine the associations and identify the key predictors of faking orgasms in both oral sex and sexual intercourse contexts.

The findings revealed that women with significant emotion regulation difficulties were more likely to report faking orgasm. Specifically, impulse control problems, such as difficulty in managing behavior during emotional distress, were linked to faking orgasms as a means of avoiding relational conflict or prematurely ending sexual activity. Lack of emotional acceptance was another contributing factor, where women struggled to tolerate negative emotions and thus faked orgasms to maintain relational harmony or avoid discomfort. Furthermore, a lack of clarity regarding their emotional states was associated with faking orgasms to foster perceived intimacy or sidestep feelings of embarrassment.

Sexual motivations also play a pivotal role in shaping this behavior. Coping-related motivations, such as using faking orgasms to manage stress or diffuse tension in relationships, were especially prominent during sexual intercourse. Self-focused motivations, in which women faked orgasms to enhance their own arousal, were observed in both oral sex and intercourse contexts. Relational motivations, which involved protecting a partner's feelings or boosting confidence, were more pronounced during oral sex, reflecting a stronger focus on relational harmony in this context.

Contextual differences emerged between oral sex and sexual intercourse, with unique motivation patterns evident in each setting. In the case of oral sex, relational motivations were dominant, with women faking orgasm to shield their partners from disappointment or maintain harmony in the relationship. In contrast, during sexual intercourse, coping motivations took precedence, driven by the need to manage negative emotions or address relational challenges, with emotion regulation difficulties playing a more central role in this context.

These findings underscore the complex interplay between difficulties in emotional regulation and sexual motivations in the behavior of faking orgasms. Women who struggle to manage negative emotions may rely on faking orgasms as a maladaptive coping mechanism, while others may use it to fulfill personal or relational objectives. This behavior is not merely a relational tactic, but also reflects deeper emotional struggles and adaptive strategies shaped by the specific sexual context.

This study offers valuable insights to clinicians and therapists working with women and couples. Understanding faking orgasms as a potential indicator of underlying emotional regulation difficulties can provide a foundation for addressing the broader issues of sexual dissatisfaction and relational tension. Interventions that focus on improving emotional awareness, fostering open communication, and enhancing relational intimacy may reduce reliance on such behaviors and lead to healthier sexual and relational outcomes.

This research highlights a clear link between emotion regulation difficulties, sexual motivations, and the reasons why women fake orgasms. By addressing these interconnected dynamics, clinicians and researchers can support women in navigating their sexual and emotional experiences, ultimately promoting greater well-being and relationship satisfaction.

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The study presented in **Chapter 4.4** (Meskó et al., 2025e) investigated the relationship between mate-retention behaviors, sociosexuality, relationship satisfaction, and the likelihood of faking orgasm during sexual intercourse and oral sex. Conducted among Hungarian women, this research sought to validate previous findings in a cross-cultural context, emphasizing the predictive role of mate-retention strategies and relational dynamics in faking orgasm.

The study analyzed data from 449 Hungarian women aged 18–64 years (M = 33.95; SD = 10.14) recruited via online advertisements and newsletters targeting Hungarian women. Participants completed an online survey consisting of the Faking Orgasm Scale for Women (FOS), the Mate Retention Inventory (MRI), the Revised Sociosexual Inventory (SOI-R), and the Hungarian Relationship Assessment Scale (RAS-H). Binomial regression analyses and Structural Equation Modeling (SEM) were used to explore the predictors and interrelationships among these variables.

The results indicated that more frequent mate-retention behaviors, lower relationship satisfaction, and unrestricted sociosexuality were associated with a higher likelihood of faking orgasm during sexual intercourse. Women with unrestricted sociosexuality tended to report lower satisfaction with their relationships, which indirectly increased their engagement in mate-retention behaviors. In turn, these behaviors positively predicted the likelihood of a faking orgasm.

Sociosexuality similarly predicted lower relationship satisfaction in the context of oral sex, which was associated with increased mate retention behaviors. However, mate-retention behaviors directly predicted faking orgasm during oral sex, whereas sociosexuality and relationship satisfaction were not significant direct predictors in this context. These findings highlight the complexity of the motivations underlying faking orgasm and suggest that mate-retention strategies play a central role in this behavior across both sexual contexts.

These findings align with evolutionary psychological theories, suggesting that faking orgasm serves as a mate-retention strategy aimed at enhancing relational harmony and securing a partner’s emotional and sexual investment. Women with lower relationship satisfaction may fake orgasms as a compensatory mechanism to mitigate relational dissatisfaction or to prevent

potential infidelity. Conversely, women with unrestricted sociosexuality may fake orgasms to manipulate or manage partners within causal or short-term relational contexts.

This study also underscores the cultural nuances that influence faking orgasm. While the results are consistent with previous research conducted in North America and Brazil, the Hungarian sample reflects distinct sociosexual norms and relational values. For example, Hungarian women demonstrate a mix of collectivist and individualist attitudes toward relational harmony, shaping their motivations for faking orgasms.

This study provides critical insights for clinicians and therapists addressing the relational and sexual well-being of women and couples. By understanding the underlying motivations and relational dynamics associated with faking orgasms, practitioners can better support individuals in navigating their emotional intimacy and sexual communication. Educational programs and therapeutic interventions focused on enhancing relationship satisfaction and reducing reliance on maladaptive mate-retention behaviors could improve relational and sexual outcomes.

This study highlights the predictive role of mate-retention behaviors, sociosexuality, and relationship satisfaction in women's faking orgasm across different sexual contexts. These findings contribute to a deeper understanding of female sexual psychology and relational dynamics, thereby emphasizing the need for culturally sensitive approaches in both research and practice.

Conclusions

This thesis begins with the idea that mutineers of the HMS Bounty, along with a few native Tahitians—a handful of men and women—settled on Pitcairn Island 234 years ago. According to historians, numerous deadly conflicts erupted over power and mating among settlers, but the situation eventually stabilized. Today, an independent community, including descendants of the original settlers, resides on the island. The story of Bounty's mutineers is not merely an exciting maritime adventure but also a naturalistic human experiment, offering unique insights into mating and relationship dynamics. Documented contact between mutineers and Polynesian natives reveals social and sexual patterns that reflect fundamental aspects of human behavior under isolated conditions, given that the related events took place in a microenvironment of scarce resources and isolated communal dynamics. The historical account of Bounty's mutineers and other similar historical examples provides a deeper understanding of how human mating behavior shapes relationships and how it is connected to the broader framework of evolutionary psychology.

One of the fundamental aspects of human nature is sexual and relational functioning, which plays a decisive role in the lives of both individuals' and social groups.' To gain deeper

understanding of these processes, it is essential to examine the psychological aspects of mating. Mate selection preferences, attachment patterns, and motivational factors of sexual behavior are closely intertwined with the evolutionary and sociocultural factors that shape human interactions and relationship dynamics. Psychological research in this field has revealed that reproductive success and the quality of social relationships significantly influence an individual's well-being and personal development.

This thesis is unconventional in the sense that it does not focus on a single empirical question but presents a series of studies to illustrate the crucial role that the evolutionary approach can play in elucidating the psychological factors of human sexuality and relationship dynamics. In particular, it demonstrates how individual differences in sexual motivation, dynamics of sex-for-resource transactions, and women's faking orgasm can be better understood by considering the adaptive challenges of human mating psychology. A significant portion of the presented findings is the result of international collaborations, which reflects global scientific interest in the psychology of human sexuality and relationship dynamics. In addition to the scientific value of these collaborative projects in terms of the findings they contribute to research on the topics in focus, their outcomes highlight some of the challenges psychologists face in researching sexual and relational dynamics.

One such challenge is the lack of education in the evolutionary psychology of sexuality in traditional university psychology training. Students often lack foundational knowledge, which brings them closer to an understanding of the evolutionary dynamics of human relationships. Another challenge is that, while questionnaire methods are widely used, they often fail to capture the subtler aspects of behavior as they rely on self-reports, which can be distorted by participants' memory biases or the need for social desirability. Moreover, the validity of laboratory findings is generally limited by the artificial environment as sexuality and relationship dynamics are often tied to situational and contextual elements. Additionally, it is difficult to directly observe behaviors in the focus of empirical research without raising ethical issues; for instance, delving into the details of intimate relationships is in potential conflict with participants' need for and right to privacy and emotional well-being. Using a longitudinal design in evolutionary psychological studies can also be problematic, because changes in focal factors over time, such as shifts in relationship status or sexual preferences, are difficult to model. Furthermore, researchers aiming to reveal the consequences of human evolution inherent in sexual motivation and behavior must face the limitations that conventional methods pose to their endeavors.

Despite the methodological difficulties and ethical issues posed by the evolutionary perspective, there is no doubt that related approaches have had a significant impact on psychological studies of sexuality and relationship dynamics over the past few decades. Evolutionary thinking has profoundly changed scientific discourse in psychology, not only by providing descriptive analyses, but also by emphasizing the importance of a functional approach to human behavior. Through the lens of evolutionary theories, we can understand why certain sexual strategies, relationship behaviors, and social dynamics have developed, and what adaptive functions they fulfill in human history. This functionalist perspective offers a new conceptual framework for researchers, in which the observed variations in human behavior are not only defined within given social or cultural contexts, but also as part of an evolutionary heritage serving survival and reproductive success.

Furthermore, evolutionary psychology not only helps to better understand the complexity of sexual and relationship behavior but also provides an opportunity to reconsider established scientific practices. The emphasis on functionality encourages researchers to not only examine the current conditions potentially influencing the observed behaviors or attitudes but also the evolutionary roots of the behaviors or attitudes in focus, which continue to influence social interactions and individual well-being today. Evolutionary approaches offer a broader perspective on the motivational factors of sexual behavior and relationship dynamics, and thus potentially contribute to more complex and nuanced explanations of related psychological phenomena.

In this thesis, I argue that an evolutionary approach to human mating is indispensable for the study of sexuality and relationship dynamics. Evolutionary theories offer comprehensive explanatory frameworks for fundamental aspects of human nature and enable psychological research to expand in new directions by focusing on the functional dimensions of human behavior.

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