DOCTORAL DISSERTATION

SÜLEYMAN AGAH DEMIRGÜL

ASSOCIATIONS BETWEEN PORNOGRAPHY USE, PROBLEMATIC PORNOGRAPHY USE, BODY DISSATISFACTION, AND DISORDERED EATING BEHAVIORS - FINDINGS FROM CROSS-SECTIONAL AND LONGITUDINAL STUDIES

2026

EÖTVÖS LORÁND UNIVERSITY
FACULTY OF EDUCATION AND PSYCHOLOGY

Süleyman Agah Demirgül

ASSOCIATIONS BETWEEN PORNOGRAPHY USE, PROBLEMATIC PORNOGRAPHY USE, BODY DISSATISFACTION, AND DISORDERED EATING BEHAVIORS - FINDINGS FROM CROSS-SECTIONAL AND LONGITUDINAL STUDIES

DOI: 10.15476/ELTE.2025.441

Doctoral School of Psychology

Head of the School: **Róbert Urbán**, DSc, professor, Eötvös Loránd University

Clinical Psychology and Addiction Program

Head of the Program: **Zsolt Demetrovics**, DSc, professor, Flinders University; Eötvös Loránd Tudományegyetem; University of Gibraltar

Supervisors:

Zsolt Demetrovics, DSc, professor, Flinders University; Eötvös Loránd University; University of Gibraltar

Beáta Bőthe, PhD, assistant professor, Université de Montréal

Budapest, 2026

Contents

Acknowledgements 5
List of Abbreviations 6
List of Tables 8
List of Figures 9
List of Publications the Dissertation is Based Upon 10
I. Introduction 11
I/1. The evolution of pornography use 11
I/2. Definitions of pornography use and problematic pornography use 12
I/3. Prevalence of pornography use and problematic pornography use 14
I/4. Measurement of pornography use and problematic pornography use 15
I/5. Etiology and potential consequences of pornography 16
I/6. Body dissatisfaction and disordered eating behavior 18
I/7. Foundational theories explaining the association between pornography use/ problematic pornography use and body dissatisfaction 20
I/7.1. *Social Comparison Theory* 20
I/7.2. *Self-Objectification Theory* 21
I/7.3. *Tripartite Model* 21
I/8. Conceptual framework for the present dissertation 22
I/9. Associations between pornography use, problematic pornography use, body dissatisfaction, and disordered eating behaviors in previous studies 24
I/10. Limitations of previous studies 26
I/11. Aims of the dissertation and overview of the included studies 27
I/11. References of the Introduction 29
II. Curves and Pixels: Longitudinal Associations Between Frequency of Pornography Use and Body Dissatisfaction in a Nationally Representative Sample of Young Adults 40
Abstract 40
II/1. Introduction 41
II/1.1 The present study 47
II/2.Methods 47
II/2.1. Participants 47
II/2.2. Procedure 47
II/2.3. Measures 48
II/2.4. Data analysis 49
II/3. Results 50
II/3.1. Descriptive statistics of pornography use frequency and body dissatisfaction and comparisons of men and women 50

II/3.2. Cross-sectional and longitudinal associations between pornography use frequency and body dissatisfaction 50
II/4. Discussion 51
II/4.1. Strengths, limitations, and future directions 55
II/5. Conclusions 56
II/6. References 57
III. Bidirectional Positive Associations Between Problematic Pornography Use and Body Dissatisfaction in Women and Men: Findings of a Nationally Representative One-Year Longitudinal Study 74
Abstract 74
III/1. Introduction 75
III/1.1. The present study 79
III/2. Method 79
III/2.1. Participants 79
III/2.2. Procedure 80
III/2.3. Measures 81
III/2.4. Statistical analysis 82
III/3. Results 83
III/3.1. Descriptive results of problematic pornography use and body dissatisfaction for men and women 83
III/3.2. Cross-sectional and longitudinal associations between problematic pornography use and body dissatisfaction 84
III/4. Discussion 85
III/4.1. Study limitations and future research 87
III/5. Conclusion 88
III/6. References 90
IV. A Longitudinal Examination of the Mediating Role of Body Dissatisfaction in the Relationship Between Pornography Use Frequency and Eating Disturbances: A Cross-Lagged Mediation Model 112
Abstract 112
IV/1. Introduction 113
IV/1.1. Pornography use 114
IV/1.2. Disordered eating behavior 115
IV/1.3. Associations between pornography use and disordered eating behavior 117
IV/1.4. The present study 119
IV/2. Methods 120
IV/2.1. Participants and Procedure 120
IV/2.3. Measures 120
IV/2.4. Data Analysis 121

IV/3. Results 123
IV/3.1. Descriptive statistics of pornography use, body dissatisfaction, and disordered eating behavior and comparisons of men and women 123
IV/3.2. Cross-sectional and longitudinal associations between pornography use and disordered eating behavior without the mediating variable 123
IV/3.3. The mediating role of body dissatisfaction in the associations of pornography use and disordered eating behavior 124
IV/4. Discussion 126
IV/4.1. Study limitations and future directions 128
IV/5. Conclusion 129
Data availability 130
IV/6. References 130
V. General Discussion 151
V/1. Overview of the results and major contributions to the literature 151
V/1.1. Main findings and interpretation of the included studies 151
V/1.2. Overview of contributions 158
V/3. Limitations of the present dissertation 159
V/4. Future recommendations 160
V/5. Conclusions 161
V/6. References 163
VI. Appendices 169
VI.1. Study 169
VI.2. Study 170
VI.3. Study 172

Acknowledgements

This dissertation would not have been possible without the generous financial support of the Tempus Public Foundation. I want to express my sincere gratitude to both the Hungarian and Turkish governments for their confidence in me and for accepting me into the Hungarian Government Scholarship (Stipendium Hungaricum) program following my successful completion of several examinations. I am deeply thankful for their support in covering my tuition fees and providing a monthly stipend since 2020, first for my master's studies and later for my PhD. Throughout my stay, I had the opportunity to experience the rich Hungarian culture and learn the language to some extent.

I extend my deepest gratitude to my two supervisors, Beáta Bőthe and Zsolt Demetrovics, for their unwavering support and guidance throughout this journey.

Zsolt, thank you very much for believing in me during my PhD; it helped me explore my various interests in the field. Your support extended not only to academic matters but also to personal ones.

Bea, you have been a great support. I want to emphasize the smooth communication I had with you; you were always ready to lend a helping hand. You have always supported my ideas and responded promptly to my emails. These factors significantly eased my anxiety and helped me be more productive throughout this journey.

I appreciate your patience in teaching me so much during this process and guiding me to become an analytical thinker and a thoughtful researcher.

I would like to thank my dear family, especially my father, for his emotional support, understanding, and patience throughout this challenging yet enjoyable journey in my life.

List of Abbreviations

%	Percentage
A	Cronbach's alpha
Ω	Mcdonald's Omega.
$\chi 2$	Chi-Square Test
BAT	Body Attitude Test
BD	Body Dissatisfaction
BLS	Budapest Longitudinal Study
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
DEB	Disordered Eating Behavior
df	Degrees Of Freedom
DSM-5	Fifth Edition of The Diagnostic and Statistical Manual of Mental Disorder
FIML	Full Information Maximum Likelihood
HD	Hypersexual Disorder
IAT-Sex	Internet Addiction Test-Sex
ICD-11	Eleventh Edition of the International Statistical Classification of Diseases
I-PACE	The Interaction of Person-Affect-Cognition-Execution
Kurt.	Kurtosis
MCAR	Missing Completely at Random
MLR	Robust Maximum Likelihood Estimator
N	Sample Size
NCS	The National Comorbidity Survey
OSF	Open Science Framework
PPCS	Problematic Pornography Consumption Scale
PPCS-6	Problematic Pornography Consumption Scale-Short Version
PPU	Problematic Pornography Use
PPUS	Problematic Pornography Use Scale
PUF	Pornography Use Frequency

RMSEA	Root Mean Square Error of Approximation
SD	Standard Deviation
Skew	Skewness
T	T Test Value
T1	First Data Collection
T2	Second Data Collection
TLI	Tucker–Lewis Index
WEIRD	Western, Educated, Industrialized, Rich and Democratic (Population)
WHO	World Health Organization

List of Tables

I. Introduction

I/Table 1. Overview of The Studies Presented in The Dissertation

II. Study 1.

II/Table 1. Sociodemographic Characteristics of Participants

II/Table 2. Reliability Indices, Comparisons of Men's and Women's Pornography Use Frequency, Masturbation Frequency, and Body Dissatisfaction

II/Table 3. Descriptive Statistics, Correlation Between Pornography Use Frequency, Masturbation Frequency, and Body Dissatisfaction

II/Table 4. Examination of The Relationship Between Pornography Use Frequency and Perceived Body Dissatisfaction Across Men and Women Individuals Controlling for Masturbation Frequency

III. Study 2.

III/Table 1. Sociodemographic Characteristics of Participants

III/Table 2. Reliability Indices, Comparisons of Men's and Women's Problematic Pornography Use, and Body Dissatisfaction

III/Table 3. Descriptive Statistics, Correlation Between Problematic Pornography Use and Body Dissatisfaction.

III/Table 4. Examination Of the Problematic Pornography Use and Body Dissatisfaction Among Men and Women

IV. Study 3.

IV/Table 1. Sociodemographic Characteristics of Participants

IV/Table 2. Reliability Indices, Comparisons of Men's and Women's Pornography Use Frequency, Body Dissatisfaction, and Disordered Eating Behavior

IV/Table 3. Descriptive Statistics, Correlation Between Pornography Use Frequency, Disordered Eating Behavior, and Body Dissatisfaction

IV/Table 4. Parameter Estimates for Cross-Lagged Panel Mediation Model of Pornography Use Frequency, Body Dissatisfaction, and Disordered Eating Behavior

VI. General Discussion

V/Table 1. Brief Summary of the Studies' Findings Presented in the Dissertation

Appendix II. 1. Hungarian and Original English version of the Body Attitudes Test
Appendix III. 1. Hungarian and Original English version of the Body Attitudes Test
Appendix III. 2. Hungarian And Original English Version of The Short Version of Problematic Pornography Consumption Scale
Appendix IV 1. Hungarian and Original English version of the Body Attitudes Test
Appendix IV. 2. Hungarian And Original English Version of the Eating Disorder Screening Questions

List of Figures

I. Introduction
I/Figure 1.Tripartite Influence Model of Body Image Disturbance
II. Study 1
II/Figure 1. Associations Between Pornography Use Frequency and Body Dissatisfaction Among Men Controlling for masturbation Frequency
II/Figure 2. Associations Between Pornography Use Frequency and Body Dissatisfaction Among Women Controlling for Masturbation Frequency
III. Study 2
III/Figure 1. Relationship Between Problematic Pornography Use and Body Dissatisfaction Among Men
III/Figure 2. Relationship Between Problematic Pornography Use and Body Dissatisfaction Among Women
IV. Study 3
IV/Figure 1. Mediation Model Regarding the Mediating Role of Body Dissatisfaction in The Relationship Between Pornography Use Frequency and Disordered Eating Behavior Among Men
IV/Figure 2. Mediation Model Regarding the Mediating Role of Body Dissatisfaction in The Relationship Between Pornography Use Frequency and Disordered Eating Behavior Among Women

List of Publications the Dissertation is Based Upon

Demirgül, S. A., Demetrovics, Z., Czakó, A., Paksi, B., Kökönyei, G., & Bőthe, B. (2025). Bidirectional positive associations between problematic pornography use and body dissatisfaction in women and men: Findings among Hungarian young adults in a one-year longitudinal study. *Body Image*, *54*, 101940. https://doi.org/10.1016/j.bodyim.2025.101940

Demirgül, S.A., Paquette, M.M., Bergeron, S. *et al.* Curves and Pixels: Longitudinal Associations Between Frequency of Pornography Use and Body Dissatisfaction in a Sample of Young Hungarian Adults. *Sex Res Soc Policy* (2025). https://doi.org/10.1007/s13178-025-01179-4

Demirgül, S.A., Aranda, F.F., Murcia, S.J. et al. A Longitudinal Examination of the Mediating Role of Body Dissatisfaction in the Relationship Between Pornography Use Frequency and Eating Disturbances: A Cross-Lagged Mediation Model. Arch Sex Behav 54, 3363–3379 (2025). https://doi.org/10.1007/s10508-025-03289-x

Total impact factor of the published studies: 10.7

Note: Each co-author has approved the inclusion of the publication in this dissertation.

I. Introduction

In modern society, body dissatisfaction (BD) is a widespread condition, with its prevalence increasing in parallel with the rise in online behavior engagement (Carter et al., 2017; Marques et al., 2022; Modica, 2020). Among these online behaviors, pornography use may result in greater BD because of its explicit nature, which differs from that of other online activities (e.g., Instagram and Facebook). For example, one of the most prominent features of pornography is its extreme portrayal of lean and muscular bodies, often accompanied by explicit nudity, which do not accurately reflect the general population (McKee et al., 2008). Consequently, time spent on such media may compel users to conform to unrealistic beauty standards. This often involves comparing one's own body to those depicted in the media, potentially leading to difficulties in achieving the body types presented therein (Dawson et al., 2020), ultimately resulting in BD. Moreover, given that BD is one of the most significant risk factors for disordered eating behaviors (DEB), exposure to such bodies in pornography may be positively associated with DEB (Barakat et al., 2023).

This dissertation seeks to address significant gaps in the existing knowledge by examining the longitudinal associations between problematic pornography use (PPU), pornography use frequency (PUF), BD, and DEB using a larger sample size, a one-year time interval, and a more balanced distribution of male and female participants, which were lacking in previous studies (Gewirtz-Meydan et al., 2024; Gewirtz-Meydan & Spivak-Lavi, 2023; Paslakis et al., 2022). The introduction is organized into three primary parts, beginning with a definition of the main constructs being examined, then presenting the guiding theoretical frameworks and previous empirical studies linking PUF and PPU to BD and DEB, and ultimately outlining the specific research gaps this portfolio dissertation addresses. Following this introduction, the dissertation presents three published manuscripts comprising the research portfolio, concluding with a general discussion of the findings and their implications for clinical practice and research.

I/1. The evolution of pornography use

The term *pornography* gained widespread popularity in the nineteenth century. However, erotic representations, including scripts and art that may be considered pornographic, emerged between the sixteenth, seventeenth, and eighteenth centuries in Italy, France, and England, respectively (Hunt, 1993) (Hunt, 1993). Although the term

pornography first appeared in the Oxford English Dictionary in 1857, it had already been in use in French since 1806 in Etienne-Gabriel Peignot's work titled *Dictionnaire critique, littéraire et bibliographique des principaux livres condamnés au feu, supprimés ou censures*. Turning back to its early conceptualization, the Oxford English Dictionary defined pornography as material "to stimulate erotic rather than aesthetic feelings." Later, pornography referred to sexually explicit scripts or images (Burckhardt, 1860; Hunt, 1993). Since then, the concept of pornography and its usage have undergone extensive development. Existing literature on this topic (i.e., pornography) was predominantly based on anecdotal evidence and content derived from erotic images or scripts rather than empirical research (Hunt, 1993). Therefore, pornography began to gain scientific attention only in the late twentieth century.

Since then, research on pornography has proliferated and advanced significantly, mainly due to technological developments that have increased the availability, anonymity, and accessibility of pornography, as well as its frequent use in satisfying sexual needs (Cooper, 1997). For instance, in the last 50 years, there has been a shift from erotic/pornographic books, magazines, and movies (Schmidt et al., 1973) to online pornography (Bőthe et al., 2015). Moreover, until the end of the 1900s, the concept of pornography was single and unique, but it was later associated with sexual compulsivity based on clinical observations mentioned in the book titled *Out of the Shadows: Understanding Sexual Addiction* (Carnes, 1983). However, it has since become the focus of growing empirical research on pornography use and compulsive sexual behaviors. The first study in which pornography use was examined within the framework of online sexual compulsivity was conducted by Bingham and Piotrowski (1996) in the mid-1990s, followed by the first large-scale study on this topic conducted by Goodman (1999) with over 9,000 participants.

I/2. Definitions of pornography use and problematic pornography use

The term pornography use lacks a single unified definition, despite having been empirically studied since the U.S. government established the Commission on Obscenity and Pornography in 1969 (Leventhal, 1973), which continues to limit our understanding of its conceptualization. Besides the lack of a unified definition, the term is also used interchangeably with others, such as sexually explicit material, visual sexual stimuli, obscenity, erotica, smut, filth, indecency, bawdiness, adult content, X-rated content, or dirty content (Doornwaard et al., 2015; Kohut et al., 2020; Ley et al.,

2014), highlighting not only the absence of a consistent terminology to describe such content but also a lack of unified usage of the term itself. At the beginning of the 19th century, which was a landmark year for pornography research, the definition of pornography was based on the manifest content of such media (Donnerstein & Berkowitz, 1981; Longino, 2018). However, this definition was later criticized during the early growth of pornography research, as it neglected the arousing and affective features of pornography (Fisher & Barak, 1991). The most comprehensive study on the definition of pornography was conducted in 2014 (Kohut et al., 2014), aiming to develop a single definition based on the existing literature. In this study, it was emphasized that the absence of a single, unified definition is not only a problem for the concept of definition but also poses methodological challenges, as it leads researchers to create their own definitions of pornography. Based on their work, the concept of pornography has evolved to include pictures, videos, and films depicting naked individuals or people engaging in sexual activity. Moreover, it does not have to take the form of visual representations only; it may also appear in written or audio formats that involve descriptions of nudity or sexual acts (Kohut et al., 2020).

Although pornography has a long history, its problematic use has gained significant attention from researchers over the last two decades (Grubbs et al., 2020; Laaser & Gregoire, 2003). PPU has been found to be positively associated with other addictive behaviors, such as online gaming (Bőthe et al., 2015) and gambling disorders (Mestre-Bach et al., 2024). While online gaming has been recognized as a disorder in the 11th edition of the International Classification of Diseases (ICD-11; World Health Organization, 2022), it is not classified as a disorder in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). However, online gambling is classified as a disorder in both diagnostic systems. Despite PPU exhibiting similar characteristics to these problematic behaviors, it has not yet been acknowledged as a clinical disorder in either the DSM-5 or the ICD-11, but PPU is considered a manifestation of CSBD, which is included in the ICD-11.

Clinically, pornography use was first introduced to the DSM by Kafka more than two decades ago (Kafka, 2010) as a manifestation of Hypersexual Disorder (HD). Still, this proposed diagnosis (HD) was rejected due to a lack of empirical evidence and the possibility that the condition might be linked to a high sexual drive rather than being a distinct pathology (Kafka, 2014, p. 201). However, pornography use has proliferated in the last two decades (Miller et al., 2020), , and its intense and uncontrolled use has

been associated with PPU, resulting in significant mental health problems and daily functioning problems (Altin et al., 2024; Lewczuk et al., 2019). Since PPU has not yet been recognized as a distinct disorder. Previous studies have often employed CSBD diagnostic guidelines to describe this phenomenon. PPU is currently considered a manifestation of CSBD in the ICD-11 (World Health Organization, 2022). According to the CSBD guidelines, PPU is defined as follows: i) engaging in pornography use has become a central focus of the person's life to the point of neglecting health and personal care or other interests, activities, and responsibilities; ii) the person has made numerous unsuccessful efforts to control or significantly reduce their pornography use; iii) the person continues to engage in pornography use despite negative consequences (e.g., repeated relationship disruption, occupational consequences, negative impact on health); or iv) the person continues to engage in pornography use even when they derive little or no satisfaction from it (World Health Organization, 2019).

I/3. Prevalence of pornography use and problematic pornography use

Previous nationally representative studies have indicated that the prevalence of pornography use differs between men and women, as men are more likely to engage in pornography use than women in the past week (46% vs. 16%) (Regnerus et al., 2016). Moreover, this prevalence rate increased in recent years; for example, in another nationally representative study, over 60% of men and 27% of women reported using pornography in the past week (Malki et al., 2021). Similarly, in another large-sample study conducted in the United States, 82.3% of men reported ever using pornography, while 53.4% reported use in the past year (Herbenick et al., 2017). In a separate study conducted in Australia, 84.1% of men reported ever using pornography, and 75.7% reported such use in the past year (Rissel et al., 2017). Furthermore, in a recent study in Germany, 84.9% of men and 47.9% of women reported experiencing this in the last year (Desbuleux et al., 2025). A previous study reported the prevalence of pornography use among students as 39.6%, with 51.7% of men and 33.6% of women engaging in such activities (Pouralijan et al., 2024). Furthermore, another study indicated that the prevalence of pornography use was twice as high among men compared to women, with the highest usage observed among individuals aged 18 to 27 (Lewczuk et al., 2022). These findings suggest heterogeneity in pornography use among men and women, potentially associated with the country’s cultural conservatism, as in previous studies,

conservative countries reported greater PPU than non-conservative ones (Bőthe et al., 2024).

In the case of PPU, according to previous nationally representative studies, the prevalence estimates for PPU vary between 1% and 8% in the general population, with significant gender differences, with men reporting greater PPU than women (Bőthe et al., 2020; Lewczuk et al., 2019; Rissel et al., 2017). In particular, 4% of men and 1% of women reported PPU in the past year (Rissel et al., 2017). However, these studies have mainly been conducted in Western, educated, industrialized, rich, and democratic countries (WEIRD); therefore, these findings should not be generalized to non-WEIRD countries (Grubbs et al. 2020). Moreover**,** the prevalence estimates of PPU vary considerably between studies as well. This variability can be attributed to differences in sampling (e.g., focusing on young adults vs. nationally representative samples) or measurement techniques (e.g., measuring using validated vs. non-validated scales, focusing on addiction symptoms vs. excessive use; Bőthe et al., 2024).

I/4. Measurement of pornography use and problematic pornography use

Pornography use and PPU were measured using self-report instruments and clinical interviews in previous studies (Fernandez & Griffiths, 2021; Kohut et al., 2020). In these studies, relying on self-report measurements, previous studies mostly used a single item to measure pornography use. Items used to measure pornography use included the following, listed from most to least common: “frequency” of pornography use, any use/ever used, and the amount of time spent on pornography, either in hours or minutes (Kohut et al., 2020). While previous studies have employed various tools to measure pornography use, it is recommended to utilize frequency as a measure, as it enables us to measure the quantitative aspects of behavior (Andrews, 1998).

According to a recent systematic review examining psychometric tools that measure PPU, more than 20 scales had been developed by the early 2020s (Fernandez & Griffiths, 2021). However, most of these scales did not focus on PPU itself; instead, they were developed to assess a broader concept, such as sexual addiction or cybersex (Delmonico & Miller, 2003; Wéry & Billieux, 2017). These scales were developed with addiction as a theoretical framework, yet neglecting the inclusion of two important components (withdrawal and relapse), which resulted in the development of PPCS (Bőthe et al., 2018). This review recommended only two instruments for clinicians and researchers to measure PPU (Fernandez & Griffiths, 2021). The first, the Problematic

Pornography Use Scale (PPUS), (Kor et al., 2014), measures some components using the Hypersexual Disorder criteria proposed by Kafka (2010). The second, the PPCS (Bőthe et al., 2018), which is the only instrument developed based on the six-component model of addiction, provides a strong theoretical basis for the measure (M. Griffiths, 2005). To date, the PPCS has been a more widely used instrument for measuring PPU than the PPUS, as it has been validated in over 20 languages and has been frequently employed in recent studies (Bőthe et al., 2024; Jiménez-Murcia et al., 2025).

The first component of the PPCS is salience, which denotes the significant role pornography plays in an individual's life. The second component is mood modification, which refers to the alteration of mood resulting from pornography use. The third component is conflict, which pertains to interpersonal conflicts between users and their partners, as well as impairments in the individual's occupational or academic performance. The fourth component is tolerance, which indicates increased engagement in such behavior to achieve the same mood-altering effect as previously experienced. The fifth component is relapse, which is associated with returning to previous patterns of pornography use after a period of control. The sixth component is withdrawal, which describes the negative emotional states experienced in the absence or reduction of pornography use (Bőthe et al., 2018).

I/5. Etiology and potential consequences of pornography

Given that biological factors do not solely cause mental health conditions, their etiology includes a combination of biological, psychological, and social components. Therefore, as with other mental health issues, PPU has been examined in terms of biological, psychological, and social factors (Dalooyi et al., 2023). Regarding the biological predictors of PPU, previous experimental studies have been conducted with treatment-seeking individuals and the general population. According to these studies, PPU shares a similar biological structure to substance use disorders (Love et al., 2015). For example, PPU is related to the functioning of the brain’s reward system, particularly the ventral striatum, which is associated with reward and plays a crucial role in goal-directed behaviors and mood (Brand et al., 2016). A previous study reported increased ventrolateral prefrontal cortex activation among individuals with pornography use, a region that overlaps with neural reward circuitry (Tsuji et al., 2018). The reward

pathway is disrupted when overstimulation of dopamine occurs, reducing sensitivity to natural rewards, a phenomenon known as dopamine desensitization (Brand et al., 2025).

Moreover, individuals with PPU demonstrate greater activation of the ventral striatum, which is also observed in individuals with other addictions, such as gambling and substance addiction (Gola et al., 2017). Structurally, individuals with greater pornography use have a decreased insula (Tisserand et al., 2023) as well as a complex level of cognition and inferior frontal gyrus, which results in inhibitory control problems (Antons & Matthias, 2020). Moreover, reduced gray matter volume has been observed in individuals with PPU (Kühn & Gallinat, 2014). In sum, previous studies indicate that PPU involves dysregulation of reward processing and executive functions, emphasizing PPU's similarity to other substance use and behavioral addictions.

In addition to this biological evidence, psychological and social factors may also be important variables in the etiology of PPU. In contemporary research, one of the biopsychosocial etiological theories proposed to explain the development and maintenance of various addictive behaviors, including but not limited to PPU, is the Interaction of Person-Affect-Cognition-Execution (I-PACE) model. The model was initially introduced in 2016 (Brand et al., 2016) and later revised based on recent empirical evidence (Brand et al., 2019, 2025). This model, along with its updated versions, posits that addictive behaviors arise from the interaction of predisposing factors, including affective and cognitive elements, executive functions, and stimulus-specific response inhibition. The first component of this model is the "Person," which includes biopsychological factors, such as genetic predispositions and early life experiences, including childhood trauma and emotional or physical abuse, along with their biological consequences. Additionally, in addition to early life experiences, psychopathological features such as depression and anxiety play a role in the development and maintenance of addictive behavior. Personality traits such as high impulsivity, low conscientiousness, high neuroticism, and low directedness can also contribute to the development and maintenance of such behaviors.

The second component, "Affect," pertains to how emotional states and mood regulation can lead to addictive behavior. For example, situational factors may vary among individuals based on their subjective interpretations of the situation. Some individuals may perceive these circumstances as stressful, and their responses to stress may determine whether they engage in addictive behavior as a coping mechanism. The model also suggests that individuals with impulsive coping styles and high stress

vulnerability may be more susceptible to addictive behaviors if they believe that a specific behavior can alleviate their stress. The third component, "Cognition," refers to the influence of internet-related false expectancies or illusions about addictive behaviors. For example, positive expectancies (i.e., experiencing pleasure) or avoidance experiences (i.e., escaping reality) regarding specific behaviors are cognitive biases that influence the adoption of addictive behavior. The final component, "Execution," pertains to the role of executive function in controlling or engaging in addictive behavior. This theory posits that impulsive or reactive neural systems influence addictive behaviors, while inhibitory control over desires, associated with the prefrontal cortex, diminishes during the occurrence of addictive behaviors (Brand et al., 2025). Therefore, based on the I-PACE model's propositions, it can be hypothesized that the etiology of PPU includes an interaction of biological, psychological, and social factors that predispose individuals to addictive behaviors, such as PPU.

Numerous studies have reported that PPU is positively associated with mental health issues. For example, depression (Bőthe et al., 2020), anxiety, obsessive-compulsive disorder, and attention deficit hyperactivity disorder have been positively associated with PPU in previous studies (Altin et al., 2024; Borgogna, Duncan, et al., 2018; Camilleri et al., 2021a). Furthermore, one study indicated that the link between depression and PPU was significant only among individuals who engaged in such behavior to reduce negative emotions. For women, it was not pornography itself but the functional impairments associated with PPU that resulted in depression (Borgogna, Duncan, et al., 2018), highlighting the complex underlying mechanisms in the association between PPU and depression.

The most common psychopathologies, such as depression and anxiety, were mostly observed in relation to PPU. However, given that pornography often features idealized bodies, previous studies have examined the links between PUF, PPU, and BD. These studies have yielded mixed results, although most have reported a positive association between PUF and BD (Paslakis et al., 2022). Nonetheless, PPU has consistently been positively correlated with BD, suggesting that the intensity of use may play a significant role in this association (Gewirtz-Meydan et al., 2024; Gewirtz-Meydan & Spivak-Lavi, 2023).

I/6. Body dissatisfaction and disordered eating behavior

Body image is defined as an individual's subjective perceptions, thoughts, and feelings about their body, which can be either positive or negative (Grogan, 2021). A positive body image encompasses positive perceptions and feelings about one's body, as well as a sense of comfort with one's physical characteristics. Negative body image, often synonymous with BD, involves negative perceptions and feelings about one's body, accompanied by discomfort with one's physical features (Bucchianeri & Neumark-Sztainer, 2014; Grogan, 2021; Tylka, 2011). 20). In addition to BD, DEB is another significant concern associated with exposure to idealized body images through pornography use.

DEBs are serious mental health problems characterized by maladaptive eating behaviors (Díaz-Marsá et al., 2017) and abnormal concerns about body size and weight (Rodgers & Melioli, 2016). However, DEBs, if not treated, can turn into eating disorders. There are various types of eating disorders, including anorexia nervosa, which is characterized by restriction of food intake, which potentially results in low body weight. Individuals with anorexia nervosa have skewed body image perception; therefore, they experience intense fear of gaining weight. Even though their body mass index is below average, they still feel body dissatisfaction to the extent that it harms their physical health (Favaro et al., 2009). Another common eating disorder is bulimia nervosa, which is characterized by excessive eating along with maladaptive compensatory behavior to lose the gained weight. Compensatory behaviors include laxative use, self-induced vomiting, intense exercise, and fasting. (Buerger & Jain, 2023).

Binge eating disorder is characterized by the consumption of excessive amounts of food, accompanied by a loss of control over eating behavior. This food consumption occurs within a discrete period (American Psychiatric Association, 2013). Additionally, avoidant or restrictive food intake disorder (ARFID) is characterized by the avoidance of food intake due to a loss of interest in food, a dislike of specific tastes, shapes, or colors of food, or a combination of these factors. Pica is another type of eating disorder that is characterized by a craving for non-food items such as soil, paper, ice, and hair. Another eating disorder, Other Specific Feeding and Eating Disorder (OSFED), encompasses five distinct subcategories (American Psychiatric Association, 2013).

Among these subcategories, purging disorder is intentionally engaging in purging behaviors to control weight. This disorder includes vomiting, intense exercising, and consuming laxatives; although it resembles bulimia nervosa, it does not

include excessive, intentional eating behavior. Night eating syndrome refers to excessive consumption of food after awakening from sleep. Atypical anorexia nervosa resembles anorexia nervosa; however, individuals with this disorder can be at an adequate weight between 20-25 kg or higher. When it comes to subthreshold bulimia nervosa and binge-eating disorder, these conditions do not meet the full diagnostic criteria for bulimia nervosa or binge-eating disorder but partially fulfill their respective criteria. Lastly, orthorexia nervosa, which is not a distinct eating disorder yet, is characterized by obsessive focus on healthy eating to the extent it can impair an individual's daily life due to being meticulous in food selection (American Psychiatric Association, 2013). A handful of studies have examined DEB in relation to PUF to determine whether PUF-related BD would later result in DEB (Griffiths et al., 2018). According to this study, BD in relation to PUF was associated with greater DEB. Moreover, another study examined whether BD in relation to PPU would result in DEB, and the results indicated that greater levels of PPU led to BD, which in turn resulted in DEB.

I/7. Foundational theories explaining the association between pornography use/ problematic pornography use and body dissatisfaction

I/7.1. *Social Comparison Theory*

Social Comparison Theory was first developed by Festinger (1954). This theory was developed based on the concept of opinion formation, in which social comparison plays a significant role. A few experiments were conducted in the development of this theory (Festinger, 1954). According to these studies, individuals tend to evaluate their skills and opinions in comparison to those they perceive as similar to themselves. However, when the only available comparison is significantly divergent, individuals may be able to make accurate evaluations of their opinions but not their skills.

According to this theory, human beings tend to compare themselves to others to gain insight into themselves, and this comparison is typically performed with people who are similar or close to them in terms of the respective feature (Festinger, 1954). Individuals gather information about their skills and opinions by evaluating themselves in two distinct ways: upward or downward. Concerning upward comparison, people compare themselves to those whose attributes are superior to their own. However, regarding downward comparison, people tend to compare themselves to those whose respective attributes are worse than their own (Wills, 1981).

I/7.2. *Self-Objectification Theory*

While earlier feminist theories suggest that dieting and DEB are influenced by both peers (Crandall, 1988) and parents (Costanzo & Woody, 1985; Rodin et al., 1984), Self-Objectification Theory expands this phenomenon by explaining how cultural and social interactions impact an individual's body image perception and subjective well-being. Self-Objectification Theory, developed by Fredrickson in 1977, explains the negative consequences of sexual objectification of female bodies on women's subjective well-being. This theory explains how individuals, especially women, develop symptoms of eating disorders because of perceiving their bodies as objects. Furthermore, Frederickson and Roberts (1997) indicated that constant exposure to sexual objectification leads women to internalize idealized bodies as observers' perceptions of their bodies. A recent comprehensive meta-analysis examining the association between BD and self-objectification supported this theory, with women showing greater BD in relation to self-objectification than men (Saunders et al., 2024). Consequently, both men and women may perceive themselves as objects to be observed/looked at and assessed based on their physical attributes rather than their personal characteristics, with potential gender differences. Furthermore, the theory posits that comparing one's body to established cultural beauty standards and recognizing that others may also compare their bodies to these culturally idealized standards can inevitably lead to increased body monitoring and a negative influence on subjective well-being (Fredrickson & Roberts, 1997). Within this theoretical framework, body monitoring has been identified as a fundamental behavioral characteristic of DEB. Later, a comprehensive meta-analysis of over 50 studies corroborated this finding, indicating that greater body objectification is associated with increased DEB (Schaefer & Thompson, 2018).

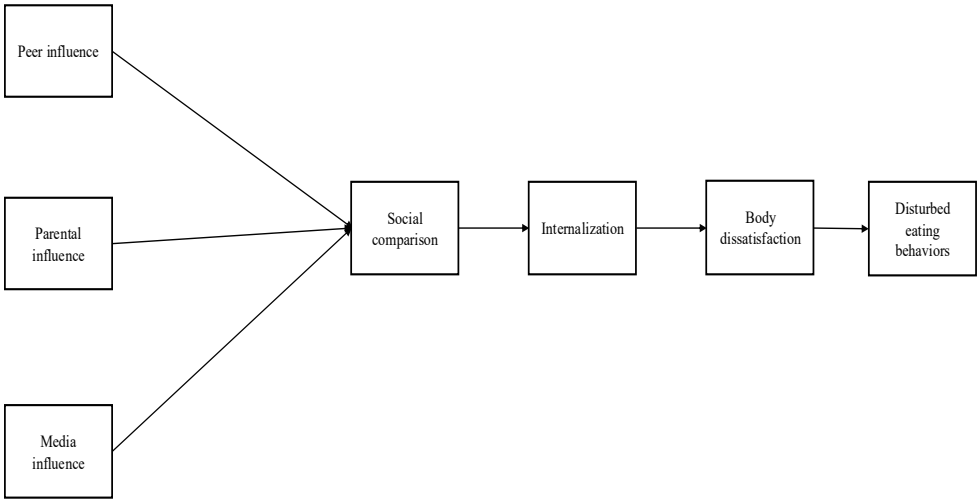
I/7.3. *Tripartite Model*

The Tripartite Model extends the Social Comparison and Self-Objectification theories by incorporating media-related pressures, upward and downward comparisons, peripheral influences, and the internalization of idealized body images (see Figure 1). While the theories above have addressed these factors separately, the Tripartite Model integrates them comprehensively to explain the onset and persistence of BD and eating disorders (Thompson et al., 1999). According to this model, socio-cultural factors compel individuals to fulfill societal ideals, where societal comparison is also inevitable. Moreover, based on these factors, this model consists of three sub-

dimensions that are key factors in the onset and maintenance of BD and DEB. These sub-dimensions encompass the influences of peers, parents, and media. According to this model, pressure related to physical appearance from these sources can negatively affect individuals by altering their self-perception, which may ultimately lead to BD and the development of eating disorders. Notably, for BD and DEB to develop, individuals must engage in social comparison and internalize the idealized body (e.g., the thin ideal).

Peer and parental influence on the development of BD or DEB can occur directly or indirectly. For the former, it is particularly noted that peers and parents may offer negative feedback regarding an individual's physical appearance, such as body shape or weight, which can contribute to the development of BD and DEB. For the latter, it may occur through media, and it is indicated that greater exposure to media can worsen an individual's body image perception, as it usually promotes idealized bodies. Thus, peers and parents contribute to the development and maintenance of BD and DEB (Heinberg, 2001). However, idealized images in the media have the most negative impact on BD, irrespective of gender and media characteristics (i.e., frequency and length of exposure, media types) (Hausenblas et al., 2013), . Moreover, idealized bodies may contribute to the development of BD and DEB (So & Kwon, 2023). In summary, this model suggests that exposure to negative comments from peers, parents, or the media, along with idealized representations of bodies in the media, may lead to the internalization of idealized body standards. Subsequently, self-comparison based on physical appearance can alter an individual's response to pressures from peers, parents, and the media, leading to BD and the development of eating disorders (Thompson et al., 1999)**.**

I/8. Conceptual framework for the present dissertation



I/Figure 2. The Tripartite Influence Model of Body Image Disturbance
(Based on Thompson, Heinberg, Altabe, &Tantleff-Dunn, 1999; Keery, van den Berg, & Thompson, 2004).

Recently, with the advent of technology, Social Comparison Theory, Self-Objectification Theory, and the Tripartite Model have been examined in relation to social networking platforms (Thompson et al., 1999). Given that these platforms consist of images and videos that highlight physical features, recent studies have suggested a positive association between BD and social networking platform use (i.e., Instagram) frequency, supporting these three theories. For example, a previous study revealed that Instagram use increased internalization of idealized images, which subsequently contributed to body monitoring behavior. However, upward social comparison mediated this association (Feltman & Szymanski, 2018). Later, a comprehensive meta-analysis supported the positive association between media consumption and self-objectification (Wang et al., 2025).

These findings offer insights into how media representations, where bodies are predominantly presented, may not only result in BD but can also contribute to the adoption of an observer's perspective on one's own body. Similar to social networking platforms such as Instagram and Facebook, pornography features idealized and unattainable body representations that shape beauty standards. This may result in individuals internalizing what is shown and evaluating their own physical attributes

against it (Fardouly et al., 2015a, 2015b). Accordingly, it may negatively affect one's self-perception and compel individuals to resemble the bodies portrayed in pornography, thus resulting in BD and later DEB (Dakanalis et al., 2015; Gewirtz-Meydan & Spivak-Lavi, 2023; Monro & Huon, 2006; Schaefer & Thompson, 2018). Therefore, the current dissertation used the Social Comparison Theory, the Self-Objectification Theory, and the Tripartite Influence Model as potential explanatory frameworks for understanding the associations between PUF, PPU, BD, and DEB.

I/9. Associations between pornography use, problematic pornography use, body dissatisfaction, and disordered eating behaviors in previous studies

Studies on pornography use and BD first emerged two decades ago with Duggan and McCreary's study (Duggan & McCreary, 2004), which examined the association between PUF and BD. This study's findings indicated that engaging in PUF contributed to social physique anxiety, because of which homosexual men reported greater BD. Most subsequent studies have examined this association among men (Cranney, 2015, 2015; Gewirtz-Meydan et al., 2024; Gewirtz-Meydan & Spivak-Lavi, 2023; Griffiths et al., 2018a, 2018b; Kvalem et al., 2016, 2016; Sevic et al., 2020; Sharp & Oates, 2019), as male populations more frequently consume pornography, although some studies have also included female participants in their samples (Borgogna et al., 2018; Peter & Valkenburg, 2014; Sharp et al., 2016).

Although PPU is more strongly associated with psychopathology and mental health-related issues (Bőthe et al., 2020), previous studies have predominantly focused on PUF rather than PPU when studying BD. Numerous studies have examined the link between PUF and BD, but their results are mixed. This heterogeneity in the findings may be explained by the differences in the samples and measures. Regarding samples, some studies were conducted only among gay individuals, and some were with heterosexual ones. Given that in previous studies, gay individuals reported greater body dissatisfaction, sexual orientation may play a role in these differences (Peplau et al., 2008). When it comes to measures, some studies measured body dissatisfaction with a single item (Peter & Valkenburg, 2014) and assessed only specific body parts, such as breast size (Peter & Valkenburg, 2014), penis size (Dogan & Yassa, 2019a), body fat, (Griffiths et al., 2018) and vulva satisfaction (Truong et al., 2017). Among these studies, only one focused on the longitudinal association between PUF and BD in adults and reported no significant results among women (Peter & Valkenburg, 2014).

In contrast, a previous study showed that Instagram use promotes the internalization of idealized images (Laemmle-Ruff et al., 2019). Other studies have also highlighted that PUF may also be positively associated with dissatisfaction with specific body parts. For example, in previous studies, women reported breast size (Peter & Valkenburg, 2014) and genital dissatisfaction (Dogan & Yassa, 2019a) in relation to the PUF. Given that PUF has been associated with specific body part dissatisfaction, resulting in deterioration of genital self-image, women have undergone esthetic surgery, such as labiaplasty (Dogan & Yassa, 2019b) or vulvar lipofilling (Truong et al., 2017) in some cases. Previous research on men has predominantly focused on BD. Compared with women, a greater number of studies have established a link between PUF and overall BD in men (Paslakis et al., 2022). In particular, men reported higher levels of negative body attitudes (Whitfield et al., 2018), body disapproval (O'Brien et al., 2015), and overall BD (Gewirtz-Meydan et al., 2024a; Gewirtz-Meydan & Spivak-Lavi, 2023b; S. Griffiths et al., 2018) in relation to their pornography use. However, other studies have not found a significant association between PUF and BD (Duggan & McCreary, 2013; Peter & Valkenburg, 2014).

Moreover, given that pornography features larger penises and muscular bodies (McKee et al., 2008; Sharp & Oates, 2019), previous studies have examined specific body parts. According to these studies, penis size dissatisfaction was linked to greater PUF (Cranney, 2015) because it skewed the perception of normal penises (Sharp & Oates, 2019). Furthermore, in relation to PUF, men perceived their stomach as bigger (Peter & Valkenburg, 2014). A previous qualitative study also indicated that pornography promoted the idea that larger panisses are needed to sexually satisfy a partner, resulting in penis augmentation surgery in some cases (Sharp & Oates, 2019).

When it comes to PPU, a handful of studies examined the association between PPU and BD among men (Gewirtz-Meydan & Spivak-Lavi, 2023) and women (Borgogna, Lathan, et al., 2018). In these studies, men with greater levels of PPU reported greater BD symptoms, whereas women did not report BD in relation to their PPU (Borgogna, Lathan, et al., 2018). The association was stronger between PPU and BD than for PUF. Based on these findings, given that PPU includes intense and poorly controlled pornography use, we can hypothesize that BD in relation to PPU may be more debilitating than PUF. Overall, although previous studies have yielded inconsistent findings, they have indicated a potentially positive association between pornography use and BD. Building on previous studies that have established a

connection between PUF, PPU, and BD, some studies have further examined whether an association exists between PUF, PPU, and DEB (Dakanalis et al., 2015; Duggan & McCreary, 2013; Gewirtz-Meydan & Spivak-Lavi, 2023; Griffiths et al., 2018). However, their findings were inconsistent, as only a few studies have reported positive associations between PUF, PPU, and DEB. Additionally, previous studies have examined this link only among men, thereby limiting our understanding of its effects on women. In a recent quantitative study, men reported greater DEB symptoms in relation to their PPU (Gewirtz-Meydan & Spivak-Lavi, 2023b).

I/10. Limitations of previous studies

While existing studies have identified a positive association between PUF, PPU, BD, and DEB (Paslakis et al., 2022), critical knowledge gaps exist regarding these associations. Notably, most prior studies have employed cross-sectional designs, except one study (Peter & Valkenburg, 2014). These cross-sectional studies have predominantly focused on male participants. The sole longitudinal study available is limited by its decade-old data, a six-month interval, and the use of a single item to measure both overall BD and pornography use. The single-item approach may not adequately capture the complex nature of the variables of interest, and previous research has recommended a multi-item measurement approach for a more comprehensive assessment (Fisher et al., 2016; Kohut et al., 2020). Additionally, the small sample sizes in previous studies limit the generalizability of their findings. Furthermore, only three studies have specifically examined PPU rather than PUF in women (Borgogna et al., 2018) and men 1/17/26 1:15:00 PM

Moreover, given that BD is a complex condition frequently comorbid with other mental health disorders, such as social anxiety (Charmaraman et al., 2021), , which stems from the fear of negative evaluation, and depression, this behavior can, over time, detrimentally impact an individual's lives. This may lead to social isolation and loneliness, which can impair an individual's daily functioning and sexual life (Mond et al., 2013). Subsequently, pornography use may function as a maladaptive coping mechanism to address perceived loneliness (Mestre-Bach & Potenza, 2023), as well as to satisfy sexual needs in the absence of a real-life partner (Daneback et al., 2012), to the extent that it may become problematic.

Although there is potential for a bidirectional relationship, to the best of our knowledge, no longitudinal studies have examined the associations between PPU and BD, thereby limiting our understanding of the directionality of this relationship (i.e., whether higher levels of PPU may lead to BD or whether BD may lead to PPU). Furthermore, DEB, for which BD is a significant risk factor, has not yet been examined cross-sectionally among female samples. Moreover, these associations have not been examined longitudinally. Another notable limitation is that, despite the significant relevance of BD in relation to PUF and PPU, its longitudinal association with DEB has not yet been examined. It is important to examine whether individuals exhibit increased resilience or vulnerability to DEB because of BD symptoms in relation to PPU over time.

I/11. Aims of the dissertation and overview of the included studies

This dissertation comprises a series of portfolio studies aimed at addressing previously identified gaps in the literature concerning the relationship between pornography use and body image and eating disorders. We investigated both non-problematic (i.e., PUF) and problematic (i.e., PPU) use of pornography. With respect to body image, our focus was exclusively on the BD. Regarding eating disorders, we concentrated on DEB, as we did not employ specific types of measurement separately for eating disorders such as anorexia nervosa and bulimia nervosa. This dissertation aimed to examine the longitudinal associations between PUF, PPU, and BD, as well as between PUF and DEB. This was achieved by incorporating sufficiently large and gender-balanced samples that allowed us to make assumptions for both genders and assess long-term BD symptoms in relation to PUF and their effects on DEB over time. In Studies 1-3, we utilized data from the Budapest Longitudinal Study, conducted between 2019 and 2022. For the first and third studies, we used data collected between 2019 and 2020. For the second study, we used data from the second and third waves, which were collected between 2020 and 2021. The previously collected dataset was made available to me by the principal investigators, following which I independently conducted the study conceptualization, statistical analyses, and manuscript preparation. All samples and procedures are described within the studies; see Table 1for an overview of the studies and their aims.

I/Table 1.

Overview of The Studies Presented in The Dissertation

	Empirical/ Theoretical	Sample(s)	Methods	Measurement tool for PUF/PPU	Covariates	Research aims
Study 1.	Empirical	Hungarian (N = 3733)	Longitudinal survey design	Single item PUF	Masturbation frequency	Examining the associations between pornography use frequency and body dissatisfaction overtime. Additionally, exploring the gender differences in this association in an explanatory manner.
Study 2.	Empirical	Hungarian (N =2801)	Longitudinal survey design	PPCS-6 (Bőthe, Tóth-Király, Demetrovics, et al., 2021)		Examining the associations between problematic pornography use and body dissatisfaction overtime. Additionally, exploring the gender differences in this association in an explanatory manner.
Study 3.	Empirical	Hungarian (N =3764)	Longitudinal survey design	Single item PUF.		Examining the associations between pornography use and disordered eating behaviors. Additionally, exploring the mediating role of body dissatisfaction overtime.

Note. PPCS = problematic pornography consumption scale; PUF = pornography use frequency; SCOFF = useful eating disorder screening questionnaire

I/11. References of the Introduction

American Psychiatric Association. in Diagnostic and statistical manual of mental disorders: DSM-5 (American Psychiatric Assoc., Washington, DC, 2013).

Altin, M., De Leo, D., Tribbia, N., Ronconi, L., & Cipolletta, S. (2024). Problematic Pornography Use, Mental Health, and Suicidality among Young Adults. *International Journal of Environmental Research and Public Health*, *21*(9), 1228.

Andrews, J. H. (1998). *Testing using log file analysis: Tools, methods, and issues*. 157–166.

Antons, S., & Matthias, B. (2020). Inhibitory control and problematic Internet-pornography use–The important balancing role of the insula. *Journal of Behavioral Addictions*, *9*(1), 58–70.

Barakat, S., McLean, S. A., Bryant, E., Le, A., Marks, P., Touyz, S., & Maguire, S. (2023). Risk factors for eating disorders: Findings from a rapid review. *Journal of Eating Disorders*, *11*(1), 8.

Bingham, J. E., & Piotrowski, C. (1996). On-line sexual addiction: A contemporary enigma. *Psychological Reports*, *79*(1), 257–258.

Borgogna, N. C., Duncan, J., & McDermott, R. C. (2018). Is scrupulosity behind the relationship between problematic pornography viewing and depression, anxiety, and stress? *Sexual Addiction & Compulsivity*, *25*(4), 293–318.

Borgogna, N. C., Lathan, E. C., & Mitchell, A. (2018a). Is women's problematic pornography viewing related to body image or relationship satisfaction? *Sexual Addiction & Compulsivity*, *25*(4), 345–366.

Borgogna, N. C., Lathan, E. C., & Mitchell, A. (2018b). Is women's problematic pornography viewing related to body image or relationship satisfaction? *Sexual Addiction & Compulsivity*, *25*(4), 345–366.

Bőthe, B., Nagy, L., Koós, M., Demetrovics, Z., Potenza, M. N., International Sex Survey Consortium, Kraus, S. W., Demirgül, S. A., Gaudet, É., & Ballester-Arnal, R. (2024). Problematic pornography use across countries, genders, and sexual orientations: Insights from the International Sex Survey and comparison of different assessment tools. *Addiction*.

Bőthe, B., Tóth-Király, I., & Orosz, G. (2015). Clarifying the Links Among Online Gaming, Internet Use, Drinking Motives, and Online Pornography Use. *Games for Health Journal*, *4*(2), 107–112. https://doi.org/10.1089/g4h.2014.0054

Bőthe, B., Tóth-Király, I., Potenza, M. N., Orosz, G., & Demetrovics, Z. (2020). High-frequency pornography use may not always be problematic. *The Journal of Sexual Medicine*, *17*(4), 793–811.

Bőthe, B., Tóth-Király, I., Zsila, Á., Griffiths, M. D., Demetrovics, Z., & Orosz, G. (2018). The development of the problematic pornography consumption scale (PPCS). *The Journal of Sex Research*, *55*(3), Article 3.

Brand, M., Müller, A., Wegmann, E., Antons, S., Brandtner, A., Müller, S. M., Stark, R., Steins-Loeber, S., & Potenza, M. N. (2025). Current interpretations of the I-PACE model of behavioral addictions. *Journal of Behavioral Addictions*, *14*(1), 1–17.

Brand, M., Snagowski, J., Laier, C., & Maderwald, S. (2016). Ventral striatum activity when watching preferred pornographic pictures is correlated with symptoms of Internet pornography addiction. *NeuroImage*, *129*, 224–232.

Brand, M., Wegmann, E., Stark, R., Müller, A., Wölfling, K., Robbins, T. W., & Potenza, M. N. (2019). The Interaction of Person-Affect-Cognition-Execution (I-PACE) model for addictive behaviors: Update, generalization to addictive behaviors beyond internet-use disorders, and specification of the process character of addictive behaviors. *Neuroscience & Biobehavioral Reviews*, *104*, 1–10.

Brand, M., Young, K. S., Laier, C., Wölfling, K., & Potenza, M. N. (2016). Integrating psychological and neurobiological considerations regarding the development and maintenance of specific Internet-use disorders: An Interaction of Person-Affect-Cognition-Execution (I-PACE) model. *Neuroscience & Biobehavioral Reviews*, *71*, 252–266. https://doi.org/10.1016/j.neubiorev.2016.08.033

Bucchianeri, M. M., & Neumark-Sztainer, D. (2014). Body dissatisfaction: An overlooked public health concern. *Journal of Public Mental Health*, *13*(2), 64–69.

Buerger, C. S., & Jain, H. (2023). Infectious complications of blood transfusion. In StatPearls [Internet]. StatPearls Publishing.

Burckhardt, J. (1860). *Civilization of the Renaissance in Italy London*.

Camilleri, C., Perry, J. T., & Sammut, S. (2021). Compulsive internet pornography use and mental health: A cross-sectional study in a sample of university students in the United States. *Frontiers in Psychology*, *11*, 613244.

Carnes, P., Green, B., & Carnes, S. (2010). The same yet different: Refocusing the Sexual Addiction Screening Test (SAST) to reflect orientation and gender. *Sexual Addiction & Compulsivity*, *17*(1), 7–30.

Carter, A., Forrest, J. I., & Kaida, A. (2017). Association between internet use and body dissatisfaction among young females: Cross-sectional analysis of the Canadian community health survey. *Journal of Medical Internet Research*, *19*(2), e39.

Charmaraman, L., Richer, A. M., Liu, C., Lynch, A. D., & Moreno, M. A. (2021). Early adolescent social media–related body dissatisfaction: Associations with depressive symptoms, social anxiety, peers, and celebrities. *Journal of Developmental & Behavioral Pediatrics*, *42*(5), 401–407.

Cooper, A. (1997). The Internet and sexuality: Into the next millenium. *Journal of Sex Education and Therapy*, *22*(1), 5–6.

Costanzo, P. R., & Woody, E. Z. (1985). Domain-specific parenting styles and their impact on the child's development of particular deviance: The example of obesity proneness. *Journal of Social and Clinical Psychology*, *3*(4), 425–445.

Crandall, C. S. (1988). Social contagion of binge eating. *Journal of Personality and Social Psychology*, *55*(4), 588.

Cranney, S. (2015). Internet pornography use and sexual body image in a Dutch sample. *International Journal of Sexual Health*, *27*(3), 316–323.

Dakanalis, A., Zanetti, A. M., Riva, G., Colmegna, F., Volpato, C., Madeddu, F., & Clerici, M. (2015). Male body dissatisfaction and eating disorder symptomatology: Moderating variables among men. *Journal of Health Psychology*, *20*(1), 80–90.

Dalooyi, S. I. S., Sharbaaf, H. A., Abdekhodaei, M. S., & Chamanabad, A. G. (2023). Biopsychosocial determinants of problematic pornography use: A systematic review. *Addiction & Health*, *15*(3), 202.

Daneback, K., Sevcikova, A., Månsson, S.-A., & Ross, M. W. (2012). Outcomes of using the internet for sexual purposes: Fulfilment of sexual desires. *Sexual Health*, *10*(1), 26–31.

Dawson, K., Nic Gabhainn, S., & MacNeela, P. (2020). Toward a model of porn literacy: Core concepts, rationales, and approaches. *The Journal of Sex Research*, *57*(1), 1–15.

Delmonico, D., & Miller, J. (2003). The Internet Sex Screening Test: A comparison of sexual compulsives versus non-sexual compulsives. *Sexual and Relationship Therapy*, *18*(3), 261–276.

Desbuleux, J. C., Desbuleux, J. F., & Fuss, J. (2025). Prevalence of first-and second-wave digisexualities in Germany and their relation to Compulsive Sexual Behavior: Findings from a National Online Survey. *Journal of Behavioral Addictions*, *14*(2), 1040–1050.

Díaz-Marsá, M., Alberdi-Páramo, Í., & Niell-Galmés, L. (2017). Nutritional supplements in eating disorders. *Actas Espanolas de Psiquiatria*, *45*(Suppl. 1), 26–36.

Dogan, O., & Yassa, M. (2019a). Major motivators and sociodemographic features of women undergoing labiaplasty. *Aesthetic Surgery Journal*, *39*(12), NP517–NP527.

Dogan, O., & Yassa, M. (2019b). Major motivators and sociodemographic features of women undergoing labiaplasty. *Aesthetic Surgery Journal*, *39*(12), NP517–NP527.

Donnerstein, E., & Berkowitz, L. (1981). Victim reactions in aggressive erotic films as a factor in violence against women. *Journal of Personality and Social Psychology*, *41*(4), 710.

Doornwaard, S. M., van den Eijnden, R. J., Overbeek, G., & ter Bogt, T. F. (2015). Differential developmental profiles of adolescents using sexually explicit internet material. *The Journal of Sex Research*, *52*(3), 269–281.

Downing Jr, M. J., Antebi, N., & Schrimshaw, E. W. (2014). Compulsive use of Internet-based sexually explicit media: Adaptation and validation of the Compulsive Internet Use Scale (CIUS). *Addictive Behaviors*, *39*(6), 1126–1130.

Duggan, S. J., & McCreary, D. R. (2004). Body image, eating disorders, and the drive for muscularity in gay and heterosexual men: The influence of media images. *Journal of Homosexuality*, *47*(3–4), 45–58. https://doi.org/10.1300/J082v47n03_03

Duggan, S. J., & McCreary, D. R. (2013). Body image, eating disorders, and the drive for muscularity in gay and heterosexual men: The influence of media images. In *Eclectic Views on Gay Male Pornography* (pp. 45–58). Routledge.

Fardouly, J., Diedrichs, P. C., Vartanian, L. R., & Halliwell, E. (2015a). Social comparisons on social media: The impact of Facebook on young women's body image concerns and mood. *Body Image*, *13*, 38–45.

Fardouly, J., Diedrichs, P. C., Vartanian, L. R., & Halliwell, E. (2015b). The mediating role of appearance comparisons in the relationship between media usage and self-objectification in young women. *Psychology of Women Quarterly*, *39*(4), 447–457.

Favaro, A., Caregaro, L., Tenconi, E., Bosello, R., & Santonastaso, P. (2009). Anorexia Nervosa and Bulimia Nervosa. J Clin Psychiatry, 70(12), 1715–1721.

Feltman, C. E., & Szymanski, D. M. (2018). Instagram use and self-objectification: The roles of internalization, comparison, appearance commentary, and feminism. *Sex Roles*, *78*(5), 311–324.

Fernandez, D. P., & Griffiths, M. D. (2021a). Psychometric instruments for problematic pornography use: A systematic review. *Evaluation & the Health Professions*, *44*(2), Article 2.

Fernandez, D. P., & Griffiths, M. D. (2021b). Psychometric Instruments for Problematic Pornography Use: A Systematic Review. *Evaluation & the Health Professions*, *44*(2), Article 2.

Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, *7*(2), 117–140.

Fisher, G. G., Matthews, R. A., & Gibbons, A. M. (2016). Developing and investigating the use of single-item measures in organizational research. *Journal of Occupational Health Psychology*, *21*(1), 3.

Fisher, W. A., & Barak, A. (1991). Pornography, erotica, and behavior: More questions than answers. *International Journal of Law and Psychiatry*, *14*(1–2), 65–83. https://doi.org/10.1016/0160-2527(91)90025-i

Fredrickson, B. L., & Roberts, T.-A. (1997). Objectification theory: Toward understanding women's lived experiences and mental health risks. *Psychology of Women Quarterly*, *21*(2), 173–206.

Gewirtz-Meydan, A., & Spivak-Lavi, Z. (2023a). The association between problematic pornography use and eating disorder symptoms among heterosexual and sexual minority men. *Body Image*, *45*, 284–295.

Gewirtz-Meydan, A., & Spivak-Lavi, Z. (2023b). The association between problematic pornography use and eating disorder symptoms among heterosexual and sexual minority men. *Body Image*, *45*, 284–295.

Gewirtz-Meydan, A., Bőthe, B., & Spivak-Lavi, Z. (2024). The Associations of Pornography Use and Body Image Among Heterosexual and Sexual Minority Men. *Archives of Sexual Behavior*, 1–14.

Gola, M., Wordecha, M., Sescousse, G., Lew-Starowicz, M., Kossowski, B., Wypych, M., Makeig, S., Potenza, M. N., & Marchewka, A. (2017). Can pornography be addictive? An fMRI study of men seeking treatment for problematic pornography use. *Neuropsychopharmacology*, *42*(10), 2021–2031.

Griffiths, M. (2005). A 'components' model of addiction within a biopsychosocial framework. *Journal of Substance Use*, *10*(4), 191–197.

Griffiths, S., Mitchison, D., Murray, S. B., & Mond, J. M. (2018a). Pornography use in sexual minority males: Associations with body dissatisfaction, eating disorder symptoms, thoughts about using anabolic steroids and quality of life. *Australian & New Zealand Journal of Psychiatry*, *52*(4), 339–348.

Griffiths, S., Mitchison, D., Murray, S. B., & Mond, J. M. (2018b). Pornography use in sexual minority males: Associations with body dissatisfaction, eating disorder symptoms, thoughts about using anabolic steroids and quality of life. *Australian & New Zealand Journal of Psychiatry*, *52*(4), 339–348.

Grogan, S. (2021). *Body image: Understanding body dissatisfaction in men, women and children*. Routledge.

Grubbs, J. B., Hoagland, K. C., Lee, B. N., Grant, J. T., Davison, P., Reid, R. C., & Kraus, S. W. (2020). Sexual addiction 25 years on: A systematic and methodological review of empirical literature and an agenda for future research. *Clinical Psychology Review*, *82*, 101925.

Hausenblas, H. A., Campbell, A., Menzel, J. E., Doughty, J., Levine, M., & Thompson, J. K. (2013). Media effects of experimental presentation of the ideal physique on eating disorder symptoms: A meta-analysis of laboratory studies. *Clinical Psychology Review*, *33*(1), 168–181.

Heinberg, L. J. (2001). *Theories of body image disturbance: Perceptual, developmental, and sociocultural factors.*

Herbenick, D., Bowling, J., Fu, T.-C., Dodge, B., Guerra-Reyes, L., & Sanders, S. (2017). Sexual diversity in the United States: Results from a nationally representative probability sample of adult women and men. *PloS One*, *12*(7), e0181198.

Hunt, L. (1993). *The invention of pornography, 1500–1800: Obscenity and the origins of modernity*. MIT Press.

Jiménez-Murcia, S., Granero, R., Testa, G., Tarragón, E., Potenza, M. N., Bőthe, B., Demetrovics, Z., Uríszar, J. C., Chiclana-Actis, C., & Fernández-Aranda, F. (2025). Validation of the Problematic Pornography Consumption Scale: Short form (PPCS-6) in a Spanish clinical population with gambling disorder. *Archives of Sexual Behavior*, 1–12.

Kafka, M. P. (2010). Hypersexual disorder: A proposed diagnosis for DSM-V. *Archives of Sexual Behavior*, *39*(2), Article 2.

Kafka, M. P. (2014). What happened to hypersexual disorder? *Archives of Sexual Behavior*, *43*(7), 1259–1261.

Kohut, T. A. (2014). *An empirical investigation of the concept of "pornography."* The University of Western Ontario (Canada).

Kohut, T., Balzarini, R. N., Fisher, W. A., Grubbs, J. B., Campbell, L., & Prause, N. (2020). Surveying pornography use: A shaky science resting on poor measurement foundations. *The Journal of Sex Research*, *57*(6), 722–742.

Kor, A., Zilcha-Mano, S., Fogel, Y. A., Mikulincer, M., Reid, R. C., & Potenza, M. N. (2014). Psychometric development of the problematic pornography use scale. *Addictive Behaviors*, *39*(5), 861–868.

Kühn, S., & Gallinat, J. (2014). Brain structure and functional connectivity associated with pornography consumption: The brain on porn. *JAMA Psychiatry*, *71*(7), 827–834.

Kvalem, I. L., Træen, B., & Iantaffi, A. (2016). Internet pornography use, body ideals, and sexual self-esteem in Norwegian gay and bisexual men. *Journal of Homosexuality*, *63*(4), 522–540.

Laaser, M., & Gregoire, L. (2003). Pastors and cybersex addiction. *Sexual and Relationship Therapy*, *18*(3), 395–404.

Laemmle-Ruff, I. L., Raggatt, M., Wright, C. J., Carrotte, E. R., Davis, A., Jenkinson, R., & Lim, M. S. (2019). Personal and reported partner pornography viewing by Australian women, and association with mental health and body image. *Sexual Health*, *16*(1), 75–79.

Leventhal, H. (1973). The 1973 Round of Obscenity-Pornography Decisions. *American Bar Association Journal*, 1261–1266.

Lewczuk, K., Wójcik, A., & Gola, M. (2019). Increase in the prevalence of online pornography use: Objective data analysis from the period between 2004 and 2016 in Poland. *Archives of Sexual Behavior*, 1–15.

Ley, D., Prause, N., & Finn, P. (2014). The emperor has no clothes: A review of the 'pornography addiction'model. *Current Sexual Health Reports*, *6*, 94–105.

Longino, H. E. (2018). Pornography, oppression, and freedom: A closer look. In *Living With Contradictions* (pp. 154–161). Routledge. https://www.taylorfrancis.com/chapters/edit/10.4324/9780429499142-20/pornography-oppression-freedom-closer-look-helen-longino

Love, T., Laier, C., Brand, M., Hatch, L., & Hajela, R. (2015). Neuroscience of internet pornography addiction: A review and update. *Behavioral Sciences*, *5*(3), 388–433.

Malki, K., Rahm, C., Öberg, K. G., & Ueda, P. (2021). Frequency of pornography use and sexual health outcomes in Sweden: Analysis of a national probability survey. *The Journal of Sexual Medicine*, *18*(10), 1735–1751.

Marques, M. D., Paxton, S. J., McLean, S. A., Jarman, H. K., & Sibley, C. G. (2022). A prospective examination of relationships between social media use and body dissatisfaction in a representative sample of adults. *Body Image*, *40*, 1–11.

McKee, A., Albury, K., & Lumby, C. (2008). *The porn report*. Melbourne University Publishing.

Mestre-Bach, G., & Potenza, M. N. (2023). Loneliness, Pornography Use, Problematic Pornography Use, and Compulsive Sexual Behavior. *Current Addiction Reports*, *10*(4), 664–676. https://doi.org/10.1007/s40429-023-00516-0

Miller, D. J., Raggatt, P. T. F., & McBain, K. (2020). A Literature Review of Studies into the Prevalence and Frequency of Men's Pornography Use. *American Journal of Sexuality Education*, *15*(4), 502–529. https://doi.org/10.1080/15546128.2020.1831676

Modica, C. A. (2020). The Associations Between Instagram Use, Selfie Activities, Appearance Comparison, and Body Dissatisfaction in Adult Men. *Cyberpsychology, Behavior, and Social Networking*, *23*(2), 90–99. https://doi.org/10.1089/cyber.2019.0434

Mond, J., Mitchison, D., Latner, J., Hay, P., Owen, C., & Rodgers, B. (2013). Quality of life impairment associated with body dissatisfaction in a general population sample of women. *BMC Public Health*, *13*(1), 920.

Monro, F. J., & Huon, G. F. (2006). Media-portrayed idealized images, self-objectification, and eating behavior. *Eating Behaviors*, *7*(4), 375–383.

O'Brien, J. E., Li, W., & Burton, D. L. (2015). Eating disordered behaviors and body disapproval in adolescent males adjudicated for sexual and nonsexual crimes. *Journal of Child Sexual Abuse*, *24*(8), 922–942.

Paslakis, G., Chiclana Actis, C., & Mestre-Bach, G. (2022). Associations between pornography exposure, body image and sexual body image: A systematic review. *Journal of Health Psychology*, *27*(3), 743–760.

Peplau LA, Frederick DA, Yee C, Maisel N, Lever J, Ghavami N. Body image satisfaction in heterosexual, gay, and lesbian adults. Archives of Sexual Behavior. 2008;38:713–725.

Pouralijan, Z., Bőthe, B., & Farnam, F. (2024). Pornography use, demographic and sexual health characteristics among university students: A gender-based comparative study of non-users, non-problematic users, and problematic users. Reproductive Health, 21(1), 103.

Peter, J., & Valkenburg, P. M. (2014). Does exposure to sexually explicit Internet material increase body dissatisfaction? A longitudinal study. *Computers in Human Behavior*, *36*, 297–307.

Regnerus, M., Gordon, D., & Price, J. (2016). Documenting Pornography Use in America: A Comparative Analysis of Methodological Approaches. *The Journal of Sex Research*, *53*(7), 873–881.

Rissel, C., Richters, J., De Visser, R. O., McKee, A., Yeung, A., & Caruana, T. (2017). A profile of pornography users in Australia: Findings from the second Australian study of health and relationships. *The Journal of Sex Research*, *54*(2), 227–240.

Rodgers, R. F., & Melioli, T. (2016). The relationship between body image concerns, eating disorders and internet use, part I: A review of empirical support. *Adolescent Research Review*, *1*(2), 95–119.

Rodin, J., Silberstein, L., & Striegel-Moore, R. (1984). *Women and weight: A normative discontent.* Nebraska symposium on motivation.

Saunders, J. F., Nutter, S., Waugh, R., & Hayden, K. A. (2024). Testing body-related components of objectification theory: A meta-analysis of the relations between body shame, self-objectification, and body dissatisfaction. *Body Image*, *50*, 101738.

Schaefer, L. M., & Thompson, J. K. (2018). Self-objectification and disordered eating: A meta-analysis. *International Journal of Eating Disorders*, *51*(6), 483–502. https://doi.org/10.1002/eat.22854

Schmidt, G., Sigusch, V., & Schäfer, S. (1973). Responses to reading erotic stories: Male-female differences. *Archives of Sexual Behavior*, *2*, 181–199.

Sevic, S., Ciprić, A., Buško, V., & Štulhofer, A. (2020). The relationship between the use of social networking sites and sexually explicit material, the internalization of appearance ideals and body self-surveillance: Results from a longitudinal study of male adolescents. *Journal of Youth and Adolescence*, *49*(2), 383–398.

Sharp, G., & Oates, J. (2019). Sociocultural influences on men's penis size perceptions and decisions to undergo penile augmentation: A qualitative study. *Aesthetic Surgery Journal*, *39*(11), 1253–1259.

Sharp, G., Tiggemann, M., & Mattiske, J. (2016). Factors that influence the decision to undergo labiaplasty: Media, relationships, and psychological well-being. *Aesthetic Surgery Journal*, *36*(4), 469–478.

So, B., & Kwon, K. H. (2023). The impact of thin-ideal internalization, appearance comparison, social media use on body image and eating disorders: A literature review. *Journal of Evidence-Based Social Work*, *20*(1), 55–71.

Thompson, J. K., Coovert, M. D., & Stormer, S. M. (1999). Body image, social comparison, and eating disturbance: A covariance structure modeling investigation. *International Journal of Eating Disorders*, *26*(1), 43–51.

Tisserand, A., Philippi, N., Botzung, A., & Blanc, F. (2023). *Me, Myself and My Insula: An Oasis in the Forefront of Self-Consciousness. Biology, 12 (4), 599*.

Truong, C., Amaya, S., & Yazdany, T. (2017). Women's perception of their vulvar appearance in a predominantly low-income, minority population. *Female Pelvic Medicine & Reconstructive Surgery*, *23*(6), 417–419.

Tsuji, T., Amemiya, A., Shirai, K., Stenholm, S., Pentti, J., Oksanen, T., Vahtera, J., & Kondo, K. (2018). Association between education and television viewing among older working and retired people: A comparative study of Finland and Japan. BMC Public Health, 18(1), 917.

Tylka, T. L. (2011). *Positive psychology perspectives on body image.*

Wang, H., Alivi, M. A. B., & Mustafa, S. E. B. (2025). Unveiling the relationship between social media and self-objectification: A three-level meta-analysis. *Body Image*, *53*, 101895.

Wéry, A., & Billieux, J. (2017). Problematic cybersex: Conceptualization, assessment, and treatment. *Addictive Behaviors*, *64*, 238–246.

Whitfield, T. H., Rendina, H. J., Grov, C., & Parsons, J. T. (2018). Viewing sexually explicit media and its association with mental health among gay and bisexual men across the US. *Archives of Sexual Behavior*, *47*(4), 1163–1172.

Wills, T. A. (1981). Downward comparison principles in social psychology. *Psychological Bulletin*, *90*(2), 245.

World Health Organization. (2022). International statistical classification of diseases and related health problems (11th ed.).

World Health Organization. (1993). Tenth Revision of the International Classification of Diseases, Chapter V: Mental and Behavioural Disorders. Diagnostic Criteria for Research. World Health Organization.

II. Curves and Pixels: Longitudinal Associations Between Frequency of Pornography Use and Body Dissatisfaction in a Nationally Representative Sample of Young Adults (Study 1)

Abstract

Introduction: Despite unrealistic body portrayals commonly seen in pornographic materials, only a few studies have examined the association between pornography use frequency (PUF) and body dissatisfaction (BD) over time and most of these studies have been limited in scope (e.g., only focused on women) and included several limitations (e.g., cross-sectional designs). The present study sought to address these gaps by investigating the associations between PUF and BD over a one-year period in a nationally representative sample of young adults, while also considering gender-related differences.

Method: We used an autoregressive cross-lagged analysis with a multi-group approach among 3,733 young adults (M_{age} = 23, SD_{age} = 4.74, 48.2% men and 51.8% women). Data for the first wave were collected between March and July 2019, and for the second wave between June and September 2020.

Results: Findings showed that higher levels of PUF were cross-sectionally associated with higher levels of BD among men and women as well. Longitudinally, a bidirectional association was present between PUF and BD in men but not in women. Men's higher levels of PUF at baseline were associated with greater BD one year later, and higher levels of BD at baseline were associated with increased PUF one year later.

Conclusions: Findings indicate that pornography use is positively linked to BD in men both short- and longer-term, but only in short-term among women. Adults who consume pornography might be influenced by the unrealistic and idealized body portrayals, resulting in body concerns.

Policy Implications: Mental health professionals should consider pornography consumption when treating individuals experiencing BD. Policymakers can integrate media literacy education that addresses the unrealistic expectations fostered by pornography into their sexual education curricula.

Keywords: Pornography, Body image, Body dissatisfaction, Adults, Longitudinal design

II/1. Introduction

The potential impact of pornography on individuals has gained significant attention in recent years, particularly due to the widespread use of technology for sexual purposes (Ševčíková et al., 2018) and the rapid rise in pornography use in the past two decades (Grubbs et al., 2019). For example, the number of online pornography users in the general population has increased by 310%, from 2.76 million to 8.54 million in Poland between October 2004 and October 2016 (Lewczuk et al., 2019). On an international level, Pornhub reports receiving more clicks than renowned platforms such as Amazon, Instagram, and eBay, with 3.4 billion monthly clicks (Limor, 2023). Moreover, XVideos and XNXX, two of the most popular pornography sites, collectively receive over 5.8 billion visits per month (Graveris, 2023; Statista, 2021), which is more visitors than TikTok has per month (Wright et al., 2023a).

The term 'pornography' does not possess a single, universally agreed upon definition. It can be defined in several ways depending on cultural perceptions, research objectives, and other factors (Lawless et al. 2023). Most often, pornography is defined as a material that "(i) creates or elicits sexual feelings or thoughts and (ii) contains explicit exposure or descriptions of sexual acts involving the genitals, such as vaginal or anal intercourse, oral sex, or masturbation" (Reid et al., 2011). Although there is no unified definition of pornography, most include the notion that its intended use is to arouse sexual gratification through the portrayal of sexual activity.

Significant gender differences exist in pornography use. According to recent nationally representative studies from Sweden (Malki et al., 2021), Australia (Rissel et al., 2017a), and the US (Grubbs et al., 2019a), men are more likely to consume pornography than women (68-76% of men vs. 27-41% of women). In addition, men have greater pornography use frequency (PUF) than women daily (27% vs.1.2%) and weekly (1-2 d/23.7% of men vs. 8.6% of women) as well. These studies highlight significant gender differences in PUF, with a clear emphasis on men's dominance over women's participation in this activity. Furthermore, sexual minority individuals exhibit differences in their PUF when compared to their heterosexual counterparts. According to previous studies' findings, sexual minority men reported greater pornography use than heterosexual men (Downing et al., 2017; Gewirtz-Meydan & Spivak-Lavi, 2023; Rissel et al., 2017a). Furthermore, given its growing prevalence, researchers have concentrated on its problematic use as well. According to a recent large-scale study

conducted across 42 countries, the prevalence of problematic pornography use varied between 3.2% and 16.6% among different subpopulations (Bőthe et al., 2024).

The potential associations of PUF with mental health outcomes have been examined in prior work. Recent studies have documented several potential positive associations of PUF with different outcomes, including increased sexual arousal among men and more sexual knowledge among women (Esplin et al., 2021; Gewirtz-Meydan et al., 2025; Sadeghi & Kilavuz, 2022). However, in addition to its potential positive effects, PUF may be linked to lower self-esteem (Kvalem et al., 2016) and depression among men (Borgogna, Duncan, et al., 2018; Kraus et al., 2015; Perry, 2018) and higher anxiety among women (Borgogna, Duncan, et al., 2018; Harper & Hodgins, 2016), Moreover, it may contribute to marital dissatisfaction (Perry & Whitehead, 2019) and occupational problems (Kumar et al., 2021) among men.

In addition to these common adverse mental health outcomes, as pornography usually depicts idealized and exaggerated body representations by featuring performers who are thinner women and larger than average men, it may contribute to body dissatisfaction (BD) (Rothman, 2021). A recent systematic review on PUF and BD have reported that PUF may negatively relate to individuals' body image perception (Paslakis et al., 2022) among individuals who may conflate these representations in pornography with reality (Griffiths et al., 2018; Vogels, 2018a). It may not only be positively associated with overall BD among men specifically (Peter & Valkenburg, 2014; Whitfield et al., 2018), but also with dissatisfaction with specific body parts as they are often prominently featured in pornography including women genitals (Dogan & Yassa, 2019a), breasts (Cranney, 2015; Peter & Valkenburg, 2014), and penises (Sharp & Oates, 2019a). However, some studies did not observe positive associations between PUF and BD (Duggan & McCreary, 2013a; Sevic et al., 2020; Vogels, 2018a). Therefore, the evidence concerning PUF and BD remains inconsistent, as studies have produced mixed results and include several limitations. For example, previous studies have predominantly used cross-sectional designs and have focused primarily on men, often lacking representative population samples.

Body image is a complex and multifaceted phenomenon that encompasses perceptions, thoughts, and feelings regarding one's physical appearance (Grogan, 2021). These perceptions may include a range of aspects, such as body weight, size, shape, skin color, and facial features (Grogan, 2021). Schilder (2013) emphasized that

body image extends beyond mere perception, functioning as a mirror of one's attitudes and interactions with others. Body image perception can be experienced at different levels, ranging from positive to negative. Individuals with BD often report feeling dissatisfied with their appearance, which can lead to a sense of discrepancy between their actual physical appearance and ideal self-appearance (Bucchianeri & Neumark-Sztainer, 2014; Grogan, 2006). Research has established a link between BD and various adverse mental health outcomes such as elevated levels of depression (Kogure et al., 2019), increased anxiety, and emotional distress (Al-Musharaf et al., 2022). Body image concerns are frequently accompanied by social physique anxiety (Barnes et al., 2020), which is experienced when one believes being judged or observed by others because of their physical appearance (Hart et al., 1989). These findings underscore the significant emotional and mental impacts of BD on individuals.

Objectification Theory, as proposed by Fredrickson (1997), focuses on the consequences of viewing and treating individuals as objects. This theory posits that constant objectification and evaluation based on appearance leads to the internalization of this perspective resulting in negative psychological and emotional outcomes. One of the central tenets of Objectification Theory is the idea of self-objectification, which takes place when individuals begin to view themselves from an outsider's perspective, frequently monitoring and evaluating their own physical appearance and therefore those with a high level of self-objectification prioritize their body's appearance over its function (McKinley & Hyde, 1996). The pervasive presence of objectification in media extends to both women and men, who, upon exposure to such objectifying content, may encounter the phenomenon of self-objectification (Daniel et al., 2014; Ward, 2016). As pornography usually portrays irrational and idealized bodies, one may internalize these irrational and idealized bodies and if their own appearance does not align with these idealized bodies, they may experience BD (Sevic et al., 2020). According to objectification theory, because women are sexually objectified and their body parts are separated from themselves and considered as a physical object, they might be more prone to experience BD (Fredrickson & Roberts, 1997). Previous studies have reported greater BD among women, with rates ranging from 9% to 28% in men and 13% to 32% in women (Fallon et al., 2014). However, as individuals age, the significance they place on their physical appearance tends to diminish, both for men and women (Esnaola et al., 2010; Quittkat et al., 2019a).

Apart from individual demographic differences, body image perception is shaped not only by individual demographic differences but also by cultural differences and the media. For example, in Western societies the ideal body for women tends to be thin, whereas men are typically portrayed as muscular or lean. This can lead to pressure on both men and women to conform to these ideals (Yean et al., 2013). In addition to sociocultural factors, online media can also affect an individual's perception of an ideal body type by promoting unrealistic beauty standards (Huang et al., 2021). When individuals internalize body ideals, they are more likely to become concerned about their physical appearance, engage in body-monitoring behaviors (Bucchianeri & Neumark-Sztainer, 2014; Fitzsimmons-Craft et al., 2012), and experience dissatisfaction with their physical appearance (Huang et al., 2021).

In addition to objectification theory, social comparison theory (Festinger, 1954) may also provide an explanation for body image concerns arising from pornography use. According to this theory, individuals tend to compare their abilities, opinions, and physical features with those of others when objective standards are lacking. Individuals often engage in comparisons to gain a deeper understanding of themselves relative to others. Social comparison is characterized by two directions known as upward and downward. Upward social comparison is the act of evaluating oneself against someone who is perceived to be superior on a particular aspect, which is associated with negative feelings, such as anger (Park & Park, 2024). Downward comparison refers to the act of evaluating oneself against someone who is perceived to be inferior on a particular aspect, resulting in more positive feelings (Wills, 1981). The use of negative upward comparison can intensify an individual's perceived inadequacies, as it frequently results in the belief that others possess physical features or abilities that the individual does not possess (Swallow & Kuiper, 1988). For instance, in the context of pornography as it portrays unrealistic bodies (Kvalem et al., 2016), individuals may be more likely to perceive shortcomings in their own physical appearance, which may result in BD as a result of upward comparison (Gewirtz-Meydan et al., 2024).

Moreover, internalizing body standards can result in a discrepancy between the actual and ideal selves. The self-discrepancy theory emphasizes the two domains of the self (actual, ideal) and differentiates between two perspectives on the self (own and significant others). The actual self encompasses the beliefs a person holds about their attributes, and the ideal self represents the characteristics they strive to possess

(Higgins, 1987). Individuals tend to align their current self with their internalized ideals about body image, which serve as their personal self-guide in this context. However, the discrepancy between an individual's current state and their desired state leads to an increase in dissatisfaction (Higgins et al., 1986). Considering this self-discrepancy between the actual self and the ideal self as a significant contributor to BD one can turn to the virtual realm (i.e., pornography) over real life sexual experiences.

Although multiple previous studies have explored the relationship between PUF and BD, their findings have been inconsistent. Only one longitudinal study examined the link between BD and pornography use in adult samples and found no evidence of a significant association between pornography exposure and BD in women (Peter & Valkenburg, 2014). However, Laemmle (2019) reported that women who consume pornography experience negative outcomes in relation to PUF, including overall body concerns. The associations of PUF with different outcomes are not limited to overall BD; PUF has been linked to concerns about smaller breast size (Peter & Valkenburg, 2014) and lower genital self-image (Dogan & Yassa, 2019b), resulting in greater interest in genital cosmetic surgery (Kalaaji et al., 2019; Sharp et al., 2015; Truong et al., 2017). Moreover, Dawson's (2020a) study showed that pornography not only contributes to BD in women but can also result in self-judgment, as it distorts societal norms regarding women's physical appearance (Dawson et al., 2020a; Paslakis et al., 2022). In sum, while the available evidence is not entirely consistent, it suggests that PUF may be negatively associated with body image and physical self-esteem among women (Doornwaard et al., 2014).

Some studies have established a link between PUF and BD among men as well, as greater pornography consumption was associated with greater overall BD in this population (Goldsmith et al., 2017; Peter & Valkenburg, 2014). It is important to note that pornography's potential association with body image may not be limited to overall BD, but can also extend to negative genital self-perception, as studies have demonstrated that increased PUF may be associated with dissatisfaction with one's penis size (Cranney, 2015; Sharp & Oates, 2019a). Furthermore, the association between pornography use and BD has been also examined among sexual minority men. According to previous studies sexual minority men reported greater BD symptoms than heterosexual men resulting from their pornography use (Gewirtz-Meydan & Spivak-Lavi, 2023; Gleason & Sprankle, 2019; Griffiths et al., 2018). Thus, it is possible that

pornography use may contribute to the development of both genital and overall BD among heterosexual and minority men, though no longitudinal studies corroborated this assumption.

Besides pornography use's well-documented positive association with masturbation (e.g., (Perry, 2020; Prause, 2019), previous studies indicated that masturbation frequency may also be associated with BD. Prior study revealed that greater levels of BD in women with eating disorders (i.e., bulimia nervosa) were associated with a reduced likelihood of masturbation and a later onset of masturbation frequency (Wiederman & Pryor, 1997). Specifically, among women, these studies indicated that masturbation may result in increased bodily response, pleasure, a sense of control, and well-being, ultimately reducing BD (Bowman, 2014; Shulman & Horne, 2003). Moreover, higher levels of BD have been found to be correlated with diminished orgasmic pleasure during masturbation, which may result in decreased engagement in solo sexual activities (Horvath et al., 2020). Therefore, it is essential to consider the potential associations of masturbation with both PUF and BD, when examining the association between BD and PUF.

In sum, high consumption of pornography has been associated with a greater desire for muscularity (Morrison et al., 2007a; Tylka & Kroon Van Diest, 2015), increased concerns about one's own body when having sex (J. Goldsmith & Burton, 2017), greater internalization of body ideals (Sevic et al., 2020), greater body monitoring behavior (Doornwaard et al., 2014b), higher negative body perception (Whitfield et al., 2018), and greater body disapproval (O'Brien et al., 2015) among men and women. However, studies examining the relationship between PUF and BD are limited. First, there is a dearth of longitudinal studies examining changes over time that could show whether pornography use might have a longer-term association with one's body image, as only one study has examined PUF and BD among adults using a longitudinal design (Peter & Valkenburg, 2014). Second, the available studies had small sample sizes and focused on specific samples (e.g., men who have sex with men); therefore, they were not necessarily representative of the general population (Borgogna et al., 2018; Dawson et al., 2020; Dogan & Yassa, 2019; Laemmle-Ruff et al., 2019; Leickly et al., 2017; Sharp & Oates, 2019b; Truong et al., 2017; Tylka, 2015; Tylka & Kroon Van Diest, 2015). Moreover, given that pornography frequently co-occurs with masturbation (Wordecha et al., 2018), and in some studies masturbation has been

positively linked to positive body image, due to increased familiarity with bodily responses (Bowman, 2014; Shulman & Horne, 2003), masturbation frequency should have been measured and accounted for in previous studies when examining the associations between PUF and BD (Perry, 2020; Prause, 2019).

II/1.1 The present study

This study aimed to investigate the cross-sectional and longitudinal relationships between PUF and BD in a representative young adult sample, considering gender-based differences and controlling for masturbation frequency (Perry, 2020; Prause, 2019). We hypothesized that PUF would be positively associated with BD cross-sectionally and one year later. Moreover, our study aimed to explore potential differences between men and women in this relationship, as previous studies have reported significant gender differences (Cranney, 2015; Peter & Valkenburg, 2014). Moreover, we also aimed to examine the potential bidirectionality of the associations between PUF and BD in an exploratory manner.

II/2.Methods

II/2.1. Participants

A total of 3,733 participants completed the self-report surveys (M_{age} = 23 years, SD = 4.74). Regarding gender, 1,801 (48.24%) were men and 1,932 (51.75%) were women. Concerning marital status, 2,103 (56.33%) of the participants reported being single, 1,504 (40.28%) were married, 10 were widows (0.26%) and 86 (2.30%) were divorced. Further descriptive statistics of the sample are presented in Table 2.

II/2.2. Procedure

We used data from the Budapest Longitudinal Study (BLS). The BLS is a representative longitudinal study investigating constructs related to various addictions and problematic behaviors, including gaming disorder, gambling disorder, compulsive sexual behaviors, and other substance use disorders (e.g., alcohol and exercise) among young adults (18–34 years) in the capital (Budapest) of Hungary. BLS was promoted through social media platforms such as Instagram and Facebook, as well as through a dedicated website created to provide information about BLS.

The data for waves 1 and 2 were collected between March and July 2019 and between June and September 2020, respectively. The data were collected through face-to-face interviews in both waves, which included sociodemographic questions and screening for addictive behaviors. To gather data on substance use, problematic behaviors, and psychological information, self-report methods were used. In wave 2, participants had the option to participate by completing online interviews or self-report questionnaires. The final weighted sample by layer categories included 3910 participants. In our study, we included 3733 participants, as they were the only individuals who could be matched across both data collection waves (the remaining participants could not be matched because of issues such as non-matching identification numbers). At Time 1, the sample comprised 3733 individuals, whereas at Time 2, 2832 participants completed the survey, indicating a 28% attrition rate between Times 1 and 2. A random stratified sampling procedure was performed according to age group and neighborhood. Prior to the data acquisition, informed consent was obtained to ensure voluntary participation. The BLS study protocol received approval from Research and Ethical Committee of the Medical Research Council (no. 60471–2/2018/EKU).

II/2.3. Measures

II/2.3.1. Sociodemographic Information

Information on gender, age, highest level of education, and marital status was collected using a researcher-derived questionnaire. Detailed sociodemographic characteristics of the participants are presented in Table 2.1.

II/2.3.2. Frequency of pornography Use

Participants responded to one question about their past-year PUF: “During the last year, how often did you watch pornographic videos/films?” They indicated their answers on a 10-point scale ranging from 0 *not once in the last year* to 10 *more than seven times a week.*

II/2.3.3. Masturbation frequency

In the present study, masturbation frequency was measured using one item “In the last year (during the past 12 months), how often did you masturbate?” Participants indicated their answers on a 10-point scale ranging from 0 *not once in the last year* to 10 *more than seven times a week.*

II/2.3.4. Body dissatisfaction

Body image was assessed using the BD subscale of the Body Attitude Test (BAT; Probst et al., 1995). This subscale comprises four items rated on a five-point Likert scale, ranging from 1 *never* to 5 *always.* An example item is "When I look at myself in the mirror, I am dissatisfied with my own body." In the present study, the internal consistency (Cronbach's alpha) of this subscale was α = .86. Higher scores on the scale indicate higher levels of BD. The Hungarian version of the scale is presented in Appendix 2.1.

II/2.4. Data analysis

We computed descriptive statistics, Cronbach's alphas and McDonald's omegas, independent samples t-tests, and correlations using SPSS 26. As Cronbach's alpha coefficient is not considered an optimal measure of reliability (Hayes & Coutts, 2020), we measured reliability using two different methods (i.e., McDonald's omega and Cronbach's alpha), see Table 2.

The main analyses were conducted using MPlus 8.7. The Robust Maximum Likelihood Estimator (MLR) was used to conduct auto-regressive cross-lagged models to investigate the relationship between PUF and BD. To test the adequacy of the model fit, we used commonly used goodness of fit indices (Brown, 2015), including the Comparative Fit Index (CFI; ≥0.90 for acceptable; ≥0.95 for excellent), Root-Mean-Square Error of Approximation (RMSEA; ≤0.06 for good, ≤0.08 for acceptable), and Tucker Lewis Index (TLI; ≥0.95 for good, ≥0.90 for acceptable (Brown, 2015). We used the Full Information Maximum Likelihood method to handle missing data (Enders & Bandalos, 2001; Newman, 2014). In interpreting our findings, we relied on Cohen's (1988) effect size criteria.

Following the procedure of previous work in the field of sex research (Girouard et al., 2021; Paquette et al., 2022), first, we investigated the relationship between PUF and BD with a saturated model in the overall sample, excluding the control variable (Model A). Next, we included the control variable (masturbation frequency) in the model (Model B). Subsequently, we incorporated gender as a grouping variable (i.e., men vs. women) into the model and employed a multi-group analysis to assess whether there were any differences across genders with respect to the relationship between PUF and BD (Model C). Following this, we tested the path coefficients between PUF and BD and constrained them to be the same across groups (Model D). Finally, we

compared the differences between Model C and D (i.e., unconstrained, and constrained models) to explore if gender differences were significant, by examining changes in chi-square, CFI, TLI, and RMSEA values.

II/3. Results

II/3.1. Descriptive statistics of pornography use frequency and body dissatisfaction and comparisons of men and women

We conducted independent samples *t* tests to investigate gender-based differences in PUF, BD, and masturbation frequency. The results demonstrated that men had significantly higher levels of T1 PUF ($M = 2.33$, $SD = 2.49$) and T2 PUF ($M = 1.21$, $SD = 2.21$) compared to women (T1 PUF $M = 0.92$, $SD = 1.93$ and T2 PUF $M = 0.26$, $SD = 1.08$). Similarly, men's T1 ($M = 3.04$, $SD = 2.75$) and T2 ($M = 1.85$, $SD = 2.70$) masturbation frequencies were found to be significantly higher than women's T1 ($M = 1.40$, $SD = 2.39$) and T2 (M = 0.76, SD = 1.90) masturbation frequencies. Conversely, women had significantly higher levels of T1 BD ($M = 4.86$, $SD = 4.97$) and T2 BD ($M = 3.65$, $SD = 4.55$) compared to men's T1 BD ($M = 2.91$, $SD = 3.70$) and T2 BD ($M = 2.82$, $SD = 4.11$). These findings indicate that PUF (T1 and T2), masturbation frequency (T1 and T2), and BD (T1 and T2) all showed gender-based differences with small to medium effect sizes, see Table 2.2.

The correlations between the variables are presented in Table 2.2. Pearson correlation coefficients showed that all associations between PUF and BD were significant, positive, and weak (*r* ranging between .09 to .10 *p*s < .001). Additionally, masturbation frequency as a control variable was positively associated with PUF at T1 and T2 as well (*r* ranging between .58 to .72 *p*s < .001). Furthermore, all associations between masturbation frequency and BD were significant, positive, and weak (*r* ranging between .09 to .14 *p*s < .001).

II/3.2. Cross-sectional and longitudinal associations between pornography use frequency and body dissatisfaction

All the models demonstrated an excellent fit to the data as the models were fully saturated (see Table 2.4 for details). To examine whether the relationship between PUF and BD differed across genders (i.e., men and women), we compared the constrained model (Model D) to the unconstrained model (Model C). (ΔCFI = 0.398, ΔTLI = 0.636,

ΔRMSEA = - 0.115). Moreover, the corrected chi-square difference test result was significant ($\Delta\chi^2$ = 382.189; p < .001). These results indicated that the associations between PUF and BD differ significantly between men and women. Therefore, the results of Model C are reported in Figures 2.1 and 2.2 and described below.

Among men, higher levels of T1 BD were associated with higher levels of T1 PUF *(r* = .21, 95% CI [.15, .26], p < .001) with a weak effect size. T2 BD was not significantly associated with T2 PUF *(r* = .05, 95% CI [-.02, .11], p = .187). Longitudinally, higher levels of T1 PUF were associated with higher levels of T2 PUF (β = .15, 95% CI [.06, .22], p < .001) and higher levels of T1 BD were associated with higher levels of T2 BD (β = .18, 95% CI [.10, .25], p < .001), with weak effect sizes. Concerning the cross-lagged longitudinal associations, higher levels of T1 PUF were associated with higher levels of T2 BD (β = .13, 95% CI [.04, .21], p = .002). Higher levels of T1 BD were associated with higher levels of T2 PUF (β = .09, 95% CI [.01, .15], p = .019). These associations were also weak in terms of effect size.

Among women, cross-sectionally, higher levels of T1 BD were associated with higher levels of T1 PUF *(r* = .18, 95% CI [.12, .23], p < .001). Higher levels of T2 PUF were associated with higher levels of T2 BD *(r* = .24, 95% CI [.17, .29], p < .001). Longitudinally, T1 PUF was not significantly associated with the T2 PUF (β = <0.01, 95% CI [-.05, .05], p = .944). Higher levels of T1 BD were associated with higher levels of T2 BD (β = .25, %95 CI [.18, .30], p < .001). Concerning the cross-lagged longitudinal associations, T1 PUF was not significantly associated with T2 BD (β = < 0.01, 95% CI [-.08, .08], p = .940). T1 BD was not significantly associated with T2 PUF (β = 0.04, 95% CI [-.00, .09], p = .090). All significant associations were weak in terms of effect size.

II/4. Discussion

A recent systematic review has documented a significant, positive association between PUF and BD (Paslakis, 2022). Yet, noticeable knowledge gaps exist when examining PUF and BD associations given the limitations of previous studies (e.g., use of cross-sectional designs, focus on homogenous, non-representative populations). Our study aimed to bridge these gaps by examining the cross-sectional and longitudinal associations between PUF and BD among a nationally representative young adult sample, considering potential gender-based differences. In the present study, men's greater PUF were positively associated with greater BD one year later, and higher levels

of BD were associated with greater PUF one year later. However, among women, neither a unidirectional nor a bidirectional association between PUF and BD over time was observed.

Our findings indicate that, in both short- and longer-term, men consistently scored higher on PUF and masturbated more frequently compared to women. However, women consistently scored higher on BD than men. A potential explanation for men's higher levels of pornography use and masturbation frequency is that pornography is known to facilitate masturbation among men thus they frequently cooccur (Carvalheira et al., 2017; Kraus et al., 2016). Higher levels of pornography consumption and masturbation by men may be attributed to their higher sexual drive (Baughman et al., 2014). Regarding higher levels of BD among women, unlike men, women may tend to place a greater emphasis on their physical appearance, regardless of age, whereas this tendency decreases in men as they age (Öberg & Tornstam, 1999; Quittkat et al., 2019b). These findings are in line with previous studies that have demonstrated that men typically have higher levels of PUF (Dawson et al., 2020b; Grubbs et al., 2019b; Rissel et al., 2017b) and masturbation frequency (Cervilla & Sierra, 2022; Gerressu et al., 2008), while women generally exhibit higher levels of BD compared to men (Frederick & Essayli, 2016; Quittkat et al., 2019b).

Regarding the cross-sectional associations between our study variables, among men, baseline PUF and BD were positively and weakly associated with each other; however, this association was not significant between T2 PUF and BD. Among women, PUF and BD were positively and weakly associated with each other at T1 and T2 as well. Given the prominence and conspicuous portrayal of enhanced muscularity and unrealistic genitalia in pornography (McKee et al., 2008), it can be hypothesized that pornography may exacerbate BD regardless of gender in the short term. Overall, our findings are in accordance with those of previous studies demonstrating pornography-related desire for muscular (Duggan & McCreary, 2013b; Morrison et al., 2007b) and mesomorphic bodies (Tylka, 2015), along with increased body surveillance (Doornwaard et al., 2014a) and dissatisfaction (Dogan & Yassa, 2019b; Griffiths et al., 2018; O'Brien et al., 2015; Whitfield et al., 2018). While comparing our findings to those of previous studies, it is crucial to consider the limited generalizability of past results due to small sample sizes and the lack of heterogeneity. The present findings

extend prior research by showing that PUF and BD are positively associated with each other among a large, representative sample of Hungarian young adults.

Concerning longitudinal findings, significant gender differences were observed. Based on the present study's findings, although effect sizes were small, we observed that more frequent pornography consumption was associated with greater BD among men over one year. This finding could relate to the representation of bodies in pornography, given that it typically exhibits larger penises and more muscular physiques than what is considered average (McKee et al., 2008). This representation may skew the perception of men's typical penises and body size (Sharp & McCreary, 2013; Sharp & Oates, 2019). Overall, our findings extend upon those of previous cross-sectional (Borgogna, Lathan, et al., 2018; Kvalem et al., 2016; Laemmle-Ruff et al., 2019; Tylka, 2015) and short-term prospective studies (Peter & Valkenburg, 2014), by showing that PUF may be positively associated with BD over one year among young men, but not women, among a large representative sample.

Although women's bodies have been prominently featured in pornography since its inception as a popular medium (Cowan et al., 1988; Klaassen & Peter, 2015), we did not observe a significant association between PUF and BD among women over time in our study. According to the literature, this might be explained by the degree to which pornography is perceived as real. Specifically, individuals who perceive pornographic content as more realistic may be less critical of it (Wright et al., 2023b). Given that men tend to perceive sex portrayed in media as more realistic than women (Punyanunt-Carter, 2006), PUF's associations with BD might not be as prominent among women as among men. It may also be possible that frequent pornography use may lead women to gain a more accurate understanding of its content (Vogels, 2018a) thereby reducing body image concerns related to pornography (Davis et al., 2019). In the previous studies, the associations between pornography use and BD were mediated by perceived realism. For example, in one study, pornography use had a positive, indirect association with body image through perceived realism for men and women as well (Vogel, 2018). However, in another study, perceived realism did not have any statistical effect on the association between pornography use and BD among heterosexual and homosexual men (Gewirtz-Meydan et al., 2024). This difference may be explained by the different sampling methods used in the studies (Atkinson, 2000; Dickinson, 2002; Gewirtz-Meydan et al., 2024).

Another possible explanation is that PUF and BD disparity between women and men can be attributed to increased media literacy in women as it serves as a protective factor, mitigating the negative impact of media on body image (Tylka, 2011). Moreover, women may be exposed to idealized bodies more frequently than men in other forms of media (e.g., television, magazines, or social media). As idealized bodies featured in pornography are extremely different than the bodies featured in other forms of media, women may not consider bodies presented in pornography as a rational basis for comparisons (Levine & Harrison, 2009; Peter & Valkenburg, 2014). Findings from the current study, when considered alongside those from a previous study by Peter and Valkenburg (2014), suggest that prolonged consumption of pornography among women may not relate negatively to their body image over the course of one year. Finally, another explanation may relate to the forms of pornography consumed by men and women. For example, women are more likely to consume written pornography than men (Solano et al., 2018); therefore, they might be less influenced by the bodies presented in video pornography.

Moreover, a bidirectional association was observed between PUF and BD in men over time. This bidirectional association suggests that pornography use may contribute to men's BD and conversely, BD may contribute to greater engagement in pornography use one year later. A potential explanation for these results is that messages within pornography, rooted in masculine gender role ideology, could shape men's body-related, relational, and psychological well-being, (Tylka, 2015). As a result, men may experience distressing sexual difficulties, thus withdrawing from real-life sexual experiences due to perceived BD and increased cognitive distortion related to sexual performance (Carvalheira et al., 2017). A further explanation relates to the potential consequences of social isolation and low self-esteem stemming from social physique anxiety (Barnes et al., 2020) in response to BD (Ruscio et al., 2008). Accordingly, men with BD may turn to pornography as a means of fulfilling sexual gratification rather than seeking out real-life sexual experiences. Although a significant longitudinal association was observed between baseline PUF and BD six months later among men in a previous study (Peter & Valkenburg, 2014), no bidirectional association was found. To our knowledge, our findings are the first supporting bidirectional associations between PUF and BD among men. However, it needs to be

noted that the observed associations were small, suggesting that other factors may play more crucial roles in men's BD than PUF.

Our findings provide compelling evidence for the positive association between PUF and body image concerns with significant gender differences. Mental health professionals may consider integrating strategies to assess pornography consumption alongside available interventions for body-related problems. For example, they could use a combination of assessment tools focusing on PUF and BD. They may also develop treatment plans using multifaceted approaches such as combining therapy with psychoeducation to enhance individual's ability to critically evaluate the bodies depicted in pornography.

II/4.1. Strengths, limitations, and future directions

The present study investigated the longitudinal association between PUF and BD in a large representative sample of young adults over a period of one year. Furthermore, our study's strengths include the consideration of masturbation frequency as a potential control variable and the use of a large sample of men and women, as previous studies primarily focused on more homogenous samples of adolescents, women, and sexual minority individuals (Cranney, 2015; Duggan & McCreary, 2013a; Paquette et al., 2023). Nonetheless, our study is not without limitations. First, even though a longitudinal design was applied, the cause-effect relationships between the variables cannot determined. Second, this study did not measure the types of pornographic material that individuals used, as it might be possible that individuals' BD perceptions might differ based on professional and amateur pornography (Griffiths et al., 2018; Kvalem et al., 2016). Third, despite previous studies suggesting that the associations between PUF and BD might differ among sexual minority individuals compared to their heterosexual counterparts, the present study did not include a measure of sexual orientation (Griffiths et al., 2018). Fourth, in our study, we did not provide a definition for pornography and relied on self-report measures that might have resulted in biases (i.e., recall bias or under- or over-reporting), (Štulhofer et al., 2021). Fifth, as our study was part of a larger, ongoing longitudinal study, we had limited space to ask about pornography-use-related behaviors as well as about body concerns and used single-item or brief assessment tools. This may limit the understanding of the complex nature of pornography use and its association with potential outcomes (Kohut et al., 2020). Sixth, as we used single-item measures to assess both PUF and masturbation

frequency, there is a need for a wider range of assessment tools to enable a more reliable, systematic, and standardized evaluation of these constructs. Seventh, to measure BD, we used the BD subscale of Body Attitude Test (BAT; Probst et al., 1995). BD is a complex construct that encompasses various dimensions, such as appearance, weight, and muscularity. Thus, the use of this brief measure limits the more nuanced understanding of BD's association with PUF in the present study. Future studies should delve deeper into BD, including different aspects of BD. Additionally, although the association between PUF and BD can be explained by the social comparison, self-objectification and self-discrepancy theories, we did not assess these constructs. Future research should consider how pornography use relates to the BD, considering these notions. Moreover, future studies should also examine gender minority individuals as well as more diverse samples of adults, as our sample included adults from a Western, educated, industrialized, rich, and democratic (WEIRD) country, which hinders the generalizability of the results to other populations. Lastly, future studies should consider additional constructs associated with body image such as age and the internalization of sociocultural appearance ideals (e.g., thin-ideal or muscular-ideal internalization) in examining the association between PUF and BD.

II/5. Conclusions

Even though preliminary cross-sectional evidence suggests positive associations between PUF and BD, previous studies had several shortcomings. These limitations included the sole reliance on cross-sectional designs, small sample sizes, and the lack of representative samples (Griffiths et al., 2018; Kvalem et al., 2016; Laemmle-Ruff et al., 2019; Peter & Valkenburg, 2014) limiting the generalizability of findings and the exploration of the directionality of the associations between PUF and BD. Considering these limitations, we examined the cross-sectional and longitudinal associations between PUF and BD in a representative sample of young adult women and men over one year. Our findings suggested that PUF and BD were positively and weakly associated cross-sectionally and longitudinally among men but only cross-sectionally among women. This short-term association may have been due to developing more realistic perception of pornographic material over time by women (Vogels, 2018). Although a longitudinal study design was employed, it is not possible to establish causal relationships between the variables, and our results should be interpreted with caution. Therapists working with individuals with body image concerns may incorporate queries

about their clients' pornography consumption into therapy sessions, and adding psychoeducational elements to interventions to critically assess the unrealistic physical depictions presented in pornographic content might be beneficial.

Declarations

Conflict of interests The authors have no relevant financial or non-financial interest to disclose.

Funding No funding was received for conducting this study.

Data Availability The data are available upon request from the corresponding author.

Code Availability The codes are available upon request from the corresponding author.

II/6. References

Al-Musharaf, S., Rogoza, R., Mhanna, M., Soufia, M., Obeid, S., & Hallit, S. (2022). Factors of body dissatisfaction among Lebanese adolescents: The indirect effect of self-esteem between mental health and body dissatisfaction. *BMC Pediatrics*, *22*(1), 1–11.

Atkinson, F. (2000). Survey design and sampling. *The Research Process in Nursing (4thedn). Cornwall: Blackwell Publishing*.

Barnes, M., Abhyankar, P., Dimova, E., & Best, C. (2020). Associations between body dissatisfaction and self-reported anxiety and depression in otherwise healthy men: A systematic review and meta-analysis. *PloS One*, *15*(2), e0229268.

Baughman, H. M., Jonason, P. K., Veselka, L., & Vernon, P. A. (2014). Four shades of sexual fantasies linked to the Dark Triad. *Personality and Individual Differences*, *67*, 47–51.

Borgogna, N. C., Duncan, J., & McDermott, R. C. (2018). Is scrupulosity behind the relationship between problematic pornography viewing and depression, anxiety, and stress? *Sexual Addiction & Compulsivity*, *25*(4), 293–318.

Borgogna, N. C., Lathan, E. C., & Mitchell, A. (2018). Is women's problematic pornography viewing related to body image or relationship satisfaction? *Sexual Addiction & Compulsivity*, *25*(4), 345–366.

Bowman, C. P. (2014). Women's masturbation: Experiences of sexual empowerment in a primarily sex-positive sample. *Psychology of Women Quarterly*, *38*(3), 363–378.

Brown, T. A. (2015). *Confirmatory factor analysis for applied research*. Guilford publications.

Bucchianeri, M. M., & Neumark-Sztainer, D. (2014). Body dissatisfaction: An overlooked public health concern. *Journal of Public Mental Health*, *13*(2), 64–69.

Carvalheira, A., Godinho, L., & Costa, P. (2017). The impact of body dissatisfaction on distressing sexual difficulties among men and women: The mediator role of cognitive distraction. *The Journal of Sex Research*, *54*(3), 331–340.

Cervilla, O., & Sierra, J. C. (2022). Masturbation parameters related to orgasm satisfaction in sexual relationships: Differences between men and women. *Frontiers in Psychiatry*, *13*, 903361.

Cooper, A., Scherer, C. R., Boies, S. C., & Gordon, B. L. (1999). Sexuality on the Internet: From sexual exploration to pathological expression. *Professional Psychology: Research and Practice*, *30*(2), 154.

Cohen, J. (2013). *Statistical power analysis for the behavioral sciences*. Routledge.

Cowan, G., Lee, C., Levy, D., & Snyder, D. (1988). Dominance and inequality in X-rated videocassettes. *Psychology of Women Quarterly*, *12*(3), 299–311.

Cranney, S. (2015). Internet pornography use and sexual body image in a Dutch sample. *International Journal of Sexual Health*, *27*(3), 316–323.

Daneback, K., Månsson, S.-A., Ross, M. W., & Markham, C. M. (2012). The Internet as a source of information about sexuality. *Sex Education*, *12*(5), 583–598.

Daniel, S., Bridges, S. K., & Martens, M. P. (2014). The development and validation of the Male Assessment of Self-Objectification (MASO). *Psychology of Men & Masculinity*, *15*(1), 78.

Davis, A. C., Wright, C. J., Temple-Smith, M. J., Hellard, M. E., & Lim, M. S. (2019). A health education website developed to meet young people's information needs about web-based pornography and sharing of sexually explicit imagery (SCOPE): Usability study. *JMIR Formative Research*, *3*(3), e12824.

Dawson, K., Nic Gabhainn, S., & MacNeela, P. (2020a). Toward a model of porn literacy: Core concepts, rationales, and approaches. *The Journal of Sex Research*, *57*(1), 1–15.

Dickinson, H. O. (2002). Use and abuse of statistics in nursing research. *Journal of Advanced Nursing (Wiley-Blackwell)*, *39*(5).

Dogan, O., & Yassa, M. (2019a). Major motivators and sociodemographic features of women undergoing labiaplasty. *Aesthetic Surgery Journal*, *39*(12), NP517–NP527.h

Doornwaard, S. M., Bickham, D. S., Rich, M., Vanwesenbeeck, I., van den Eijnden, R. J., & Ter Bogt, T. F. (2014a). Sex-related online behaviors and adolescents' body and sexual self-perceptions. *Pediatrics*, *134*(6), 1103–1110.

Downing, M. J., Schrimshaw, E. W., Scheinmann, R., Antebi-Gruszka, N., & Hirshfield, S. (2017). Sexually explicit media use by sexual identity: A comparative analysis of gay, bisexual, and heterosexual men in the United States. *Archives of Sexual Behavior*, *46*(6), 1763–1776.

Duggan, S. J., & McCreary, D. R. (2013a). Body image, eating disorders, and the drive for muscularity in gay and heterosexual men: The influence of media images. In *Eclectic Views on Gay Male Pornography* (pp. 45–58). Routledge.

Enders, C. K., & Bandalos, D. L. (2001). The relative performance of full information maximum likelihood estimation for missing data in structural equation models. *Structural Equation Modeling*, *8*(3), 430–457.

Esnaola, I., Rodríguez, A., & Goñi, A. (2010). Body dissatisfaction and perceived sociocultural pressures: Gender and age differences. *Salud Mental*, *33*(1), 21–29.

Esplin, C. R., Hatch, S. G., Hatch, H. D., Deichman, C. L., & Braithwaite, S. R. (2021). What motives drive pornography use? *The Family Journal*, *29*(2), 161–174.

Fallon, E. A., Harris, B. S., & Johnson, P. (2014). Prevalence of body dissatisfaction among a United States adult sample. *Eating Behaviors*, *15*(1), 151–158.

Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, *7*(2), 117–140.

Fitzsimmons-Craft, E. E., Harney, M. B., Koehler, L. G., Danzi, L. E., Riddell, M. K., & Bardone-Cone, A. M. (2012). Explaining the relation between thin ideal

internalization and body dissatisfaction among college women: The roles of social comparison and body surveillance. *Body Image*, *9*(1), 43–49.

Frederick, D. A., & Essayli, J. H. (2016). Male body image: The roles of sexual orientation and body mass index across five national US studies. *Psychology of Men & Masculinity*, *17*(4), 336.

Fredrickson, B. L., & Roberts, T.-A. (1997). Objectification Theory: Toward Understanding Women's Lived Experiences and Mental Health Risks. *Psychology of Women Quarterly*, *21*(2), 173–206.

Gerressu, M., Mercer, C. H., Graham, C. A., Wellings, K., & Johnson, A. M. (2008). Prevalence of masturbation and associated factors in a British national probability survey. *Archives of Sexual Behavior*, *37*, 266–278.

Gewirtz-Meydan, A., Bőthe, B., & Spivak-Lavi, Z. (2024). The Associations of Pornography Use and Body Image Among Heterosexual and Sexual Minority Men. *Archives of Sexual Behavior*, 1–14.

Gewirtz-Meydan, A., Feder, H., Nagy, L., Koós, M., Kraus, S. W., Demetrovics, Z., Potenza, M. N., Ballester-Arnal, R., Batthyány, D., & Bergeron, S. (2025). Motives for pornography use and women's sexual wellbeing: Insights from a 42-country study. *Journal of Behavioral Addictions*.

Gewirtz-Meydan, A., & Spivak-Lavi, Z. (2023). The association between problematic pornography use and eating disorder symptoms among heterosexual and sexual minority men. *Body Image*, *45*, 284–295.

Girouard, A., Dion, J., Bőthe, B., O'Sullivan, L., & Bergeron, S. (2021). Bullying victimization and sexual wellbeing in sexually active heterosexual, cisgender and sexual/gender minority adolescents: The mediating role of emotion regulation. *Journal of Youth and Adolescence*, *50*(11), 2136–2150.

Gleason, N., & Sprankle, E. (2019). The effects of pornography on sexual minority men's body image: An experimental study. *Psychology & Sexuality*, *10*(4), 301–315.

Goldsmith, J., & Burton, E. (2017). *Why teaching ethics to AI practitioners is important*. Thirty-First AAAI Conference on Artificial Intelligence.

Goldsmith, K., Dunkley, C. R., Dang, S. S., & Gorzalka, B. B. (2017). Pornography consumption and its association with sexual concerns and expectations among

young men and women. *The Canadian Journal of Human Sexuality*, *26*(2), 151–162.

Griffiths, S., Mitchison, D., Murray, S. B., & Mond, J. M. (2018). Pornography use in sexual minority males: Associations with body dissatisfaction, eating disorder symptoms, thoughts about using anabolic steroids and quality of life. *Australian & New Zealand Journal of Psychiatry*, *52*(4), 339–348.

Grogan, S. (2006). Body image and health: Contemporary perspectives. *Journal of Health Psychology*, *11*(4), 523–530.

Grogan, S. (2021). *Body image: Understanding body dissatisfaction in men, women and children*. Routledge.

Grubbs, J. B., Kraus, S. W., & Perry, S. L. (2019a). Self-reported addiction to pornography in a nationally representative sample: The roles of use habits, religiousness, and moral incongruence. *Journal of Behavioral Addictions*, *8*(1), 88–93.

Harper, C., & Hodgins, D. C. (2016). Examining correlates of problematic internet pornography use among university students. *Journal of Behavioral Addictions*, *5*(2), 179–191.

Hart, E. A., Leary, M. R., & Rejeski, W. J. (1989). Tie measurement of social physique anxiety. *Journal of Sport and Exercise Psychology*, *11*(1), 94–104.

Hayes, A. F., & Coutts, J. J. (2020). Use omega rather than Cronbach's alpha for estimating reliability. But…. *Communication Methods and Measures*, *14*(1), 1–24.

Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review*, *94*(3), 319.

Higgins, E. T., Bond, R. N., Klein, R., & Strauman, T. (1986). Self-discrepancies and emotional vulnerability: How magnitude, accessibility, and type of discrepancy influence affect. *Journal of Personality and Social Psychology*, *51*(1), 5.

Horvath, Z., Smith, B. H., Sal, D., Hevesi, K., & Rowland, D. L. (2020). Body image, orgasmic response, and sexual relationship satisfaction: Understanding relationships and establishing typologies based on body image satisfaction. *Sexual Medicine*, *8*(4), 740–751.

Huang, Q., Peng, W., & Ahn, S. (2021). When media become the mirror: A meta-analysis on media and body image. *Media Psychology*, *24*(4), 437–489.

Kalaaji, A., Dreyer, S., Maric, I., Schnegg, J., & Jönsson, V. (2019). Female cosmetic genital surgery: Patient characteristics, motivation, and satisfaction. *Aesthetic Surgery Journal*, *39*(12), 1455–1466.

Klaassen, M. J., & Peter, J. (2015). Gender (in) equality in internet pornography: A content analysis of popular pornographic internet videos. *The Journal of Sex Research*, *52*(7), 721–735.

Kogure, G. S., Ribeiro, V. B., Lopes, I. P., Furtado, C. L. M., Kodato, S., de Sá, M. F. S., Ferriani, R. A., da Silva Lara, L. A., & Dos Reis, R. M. (2019). Body image and its relationships with sexual functioning, anxiety, and depression in women with polycystic ovary syndrome. *Journal of Affective Disorders*, *253*, 385–393.

Kohut, T., Balzarini, R. N., Fisher, W. A., Grubbs, J. B., Campbell, L., & Prause, N. (2020). Surveying pornography use: A shaky science resting on poor measurement foundations. *The Journal of Sex Research*, *57*(6), 722–742.

Kraus, S. W., Martino, S., & Potenza, M. N. (n.d.). Clinical Characteristics of Men Interested in Seeking Treatment for Use of Pornography. *Journal of Behavioral Addictions*, *5*(2), 169–178.

Kraus, S. W., Potenza, M. N., Martino, S., & Grant, J. E. (2015). Examining the psychometric properties of the Yale–Brown Obsessive–Compulsive Scale in a sample of compulsive pornography users. *Comprehensive Psychiatry*, *59*, 117–122.

Kumar, P., Patel, V. K., Bhatt, R. B., Vasavada, D. A., Sangma, R. D., & Tiwari, D. S. (2021). Prevalence of problematic pornography use and attitude toward pornography among the undergraduate medical students. *Journal of Psychosexual Health*, *3*(1), Article 1.

Kvalem, I. L., Træen, B., & Iantaffi, A. (2016). Internet pornography use, body ideals, and sexual self-esteem in Norwegian gay and bisexual men. *Journal of Homosexuality*, *63*(4), 522–540.

Laemmle-Ruff, I. L., Raggatt, M., Wright, C. J., Carrotte, E. R., Davis, A., Jenkinson, R., & Lim, M. S. (2019). Personal and reported partner pornography viewing by Australian women, and association with mental health and body image. *Sexual Health*, *16*(1), 75–79.

Lawless, N. J., Karantzas, G. C., & Knox, L. (2023). The Development and Validation of the Pornography Use in Romantic Relationships Scale. *Archives of Sexual Behavior*, *52*(4), 1799–1818.

Leickly, E., Nelson, K., & Simoni, J. (2017). Sexually explicit online media, body satisfaction, and partner expectations among men who have sex with men: A qualitative study. *Sexuality Research and Social Policy*, *14*(3), 270–274.

Levine, M. P., & Harrison, K. (2009). Effects of media on eating disorders and body image. In *Media effects* (pp. 506–532). Routledge.

Lewczuk, K., Wójcik, A., & Gola, M. (2019). Increase in the prevalence of online pornography use: Objective data analysis from the period between 2004 and 2016 in Poland. *Archives of Sexual Behavior*, 1–15.

Malki, K., Rahm, C., Öberg, K. G., & Ueda, P. (2021). Frequency of pornography use and sexual health outcomes in Sweden: Analysis of a national probability survey. *The Journal of Sexual Medicine*, *18*(10), 1735–1751

McKee, A., Albury, K., & Lumby, C. (2008). *The porn report*. Melbourne University Publishing.

McKinley, N., & Hyde, J. (1996). The objectified body consciousness scale: Self-objectification, body shame, and disordered eating. *Psychology of Women Quarterly*, *22*, 623–636.

Morrison, T. G., Morrison, M. A., & Bradley, B. A. (2007a). Correlates of gay men's self-reported exposure to pornography. *International Journal of Sexual Health*, *19*(2), 33–43.

Newman, D. A. (2014). Missing data: Five practical guidelines. *Organizational Research Methods*, *17*(4), 372–411.

Öberg, P., & Tornstam, L. (1999). Body images among men and women of different ages. *Ageing & Society*, *19*(5), 629–644. Cambridge University Press

O'Brien, J. E., Li, W., & Burton, D. L. (2015). Eating disordered behaviors and body disapproval in adolescent males adjudicated for sexual and nonsexual crimes. *Journal of Child Sexual Abuse*, *24*(8), 922–942.

Paquette, M.-M., Bőthe, B., Dion, J., Girouard, A., & Bergeron, S. (2023). Can I Love My Body Even if It Doesn't Look Like the Porn Stars'? Longitudinal Associations Between Pornography Use Frequency and Body Appreciation in a Diverse Sample of Adolescents. *Archives of Sexual Behavior*, 1–19.

Paquette, M.-M., Dion, J., Bőthe, B., Girouard, A., & Bergeron, S. (2022). Heterosexual, cisgender and gender and sexually diverse adolescents' sexting behaviors: The role of body appreciation. *Journal of Youth and Adolescence*, *51*(2), 278–290.

Park, H. J., & Park, Y. B. (2024). Negative upward comparison and relative deprivation: Sequential mediators between social networking service usage and loneliness. *Current Psychology*, *43*(10), 9141–9151.

Paslakis, G., Chiclana Actis, C., & Mestre-Bach, G. (2022). Associations between pornography exposure, body image and sexual body image: A systematic review. *Journal of Health Psychology*, *27*(3), 743–760.

Perry, S. L. (2018). Pornography use and depressive symptoms: Examining the role of moral incongruence. *Society and Mental Health*, *8*(3), 195–213.

Perry, S. L. (2020). Is the link between pornography use and relational happiness really more about masturbation? Results from two national surveys. *The Journal of Sex Research*, *57*(1), 64–76.

Perry, S. L., & Whitehead, A. L. (2019). Only bad for believers? Religion, pornography use, and sexual satisfaction among American men. *The Journal of Sex Research*, *56*(1), 50–61.

Peter, J., & Valkenburg, P. M. (2014). Does exposure to sexually explicit Internet material increase body dissatisfaction? A longitudinal study. *Computers in Human Behavior*, *36*, 297–307.

Prause, N. (2019). Porn is for masturbation. *Archives of Sexual Behavior*, *48*(8), 2271–2277.

Probst, M., Vandereycken, W., Coppenolle, H. V., & Vanderlinden, J. (1995). The Body Attitude Test for patients with an eating disorder: Psychometric characteristics of a new questionnaire. *Eating Disorders*, *3*(2), 133–144.

Punyanunt-Carter, N. M. (2006). Love on television: Reality perception differences between men and women. *North American Journal of Psychology*, *8*(2).

Quittkat, H. L., Hartmann, A. S., Düsing, R., Buhlmann, U., & Vocks, S. (2019a). Body dissatisfaction, importance of appearance, and body appreciation in men and women over the lifespan. *Frontiers in Psychiatry*, *10*, 864.

Reid, R. C., Li, D. S., Gilliland, R., Stein, J. A., & Fong, T. (2011). Reliability, validity, and psychometric development of the pornography consumption inventory in a sample of hypersexual men. *Journal of Sex & Marital Therapy*, *37*(5), 359–385.

Rissel, C., Richters, J., De Visser, R. O., McKee, A., Yeung, A., & Caruana, T. (2017a). A profile of pornography users in Australia: Findings from the second Australian study of health and relationships. *The Journal of Sex Research*, *54*(2), 227–240.

Rothman, E. F. (2021). *Pornography and public health*. Oxford University Press.

Ruscio, A. M., Brown, T. A., Chiu, W. T., Sareen, J., Stein, M. B., & Kessler, R. C. (2008). Social fears and social phobia in the USA: results from the National Comorbidity Survey Replication. *Psychological Medicine*, *38*(1), 15–28.

Sadeghi, E., & Kilavuz, M. (2022). How is sex knowledge and sex attitude and pornography usage status among students? *The Journal of Sexual Medicine*, *19*(11), S131.

Schilder, P. (2013). *The image and appearance of the human body* (Vol. 163). Routledge.

Ševčíková, A., Blinka, L., & Soukalová, V. (2018). Excessive internet use for sexual purposes among members of Sexaholics Anonymous and Sex Addicts Anonymous. *Sexual Addiction & Compulsivity*, *25*(1), 65–79.

Sevic, S., Ciprić, A., Buško, V., & Štulhofer, A. (2020). The relationship between the use of social networking sites and sexually explicit material, the internalization of appearance ideals and body self-surveillance: Results from a longitudinal study of male adolescents. *Journal of Youth and Adolescence*, *49*(2), 383–398.

Sharp, G., & Oates, J. (2019a). Sociocultural influences on men's penis size perceptions and decisions to undergo penile augmentation: A qualitative study. *Aesthetic Surgery Journal*, *39*(11), 1253–1259.

Sharp, G., Tiggemann, M., & Mattiske, J. (2015). Predictors of consideration of labiaplasty: An extension of the tripartite influence model of beauty ideals. *Psychology of Women Quarterly*, *39*(2), 182–193.

Shulman, J. L., & Horne, S. G. (2003). The use of self-pleasure: Masturbation and body image among African American and European American women. *Psychology of Women Quarterly*, *27*(3), 262–269.

Solano, I., Eaton, N. R., & O'Leary, K. D. (2018). Pornography consumption, modality and function in a large internet sample. *The Journal of Sex Research*.

Swallow, S. R., & Kuiper, N. A. (1988). Social comparison and negative self-evaluations: An application to depression. *Clinical Psychology Review*, *8*(1), 55–76.

Truong, C., Amaya, S., & Yazdany, T. (2017). Women's perception of their vulvar appearance in a predominantly low-income, minority population. *Female Pelvic Medicine & Reconstructive Surgery*, *23*(6), 417–419. :

Tylka, T. L. (2015). No harm in looking, right? Men's pornography consumption, body image, and well-being. *Psychology of Men & Masculinity*, *16*(1), 97.

Tylka, T. L., & Kroon Van Diest, A. M. (2015). You looking at her "hot" body may not be "cool" for me: Integrating male partners' pornography use into objectification theory for women. *Psychology of Women Quarterly*, *39*(1), 67–84.

Vogels, E. A. (2018a). Loving oneself: The associations among sexually explicit media, body image, and perceived realism. *The Journal of Sex Research*.

Ward, L. M. (2016). Media and sexualization: State of empirical research, 1995–2015. *The Journal of Sex Research*, *53*(4–5), 560–577.

Whitfield, T. H., Rendina, H. J., Grov, C., & Parsons, J. T. (2018). Viewing sexually explicit media and its association with mental health among gay and bisexual men across the US. *Archives of Sexual Behavior*, *47*(4), 1163–1172.

Wiederman, M. W., & Pryor, T. (1997). Body dissatisfaction and sexuality among women with bulimia nervosa. *International Journal of Eating Disorders*, *21*(4), 361–365.

Wills, T. A. (1981). Downward comparison principles in social psychology. *Psychological Bulletin*, *90*(2), 245.

Wordecha, M., Wilk, M., Kowalewska, E., Skorko, M., Łapiński, A., & Gola, M. (2018). "Pornographic binges" as a key characteristic of males seeking treatment for compulsive sexual behaviors: Qualitative and quantitative 10-week-long diary assessment. *Journal of Behavioral Addictions*, *7*(2), 433–444.

Wright, P. J., Tokunaga, R., & Herbenick, D. (2023a). But Do Porn Sites Get More Traffic than TikTok, OpenAI, and Zoom? *The Journal of Sex Research*, 1–5.

Wright, P. J., Tokunaga, R. S., & Herbenick, D. (2023b). Perceived similarity, utility, and social realism as potential mediators of the link between pornography use and condomless sex. *Health Communication*, *38*(9), 1800–1812.

Yean, C., Benau, E. M., Dakanalis, A., Hormes, J. M., Perone, J., & Timko, C. A. (2013). The relationship of sex and sexual orientation to self-esteem, body shape satisfaction, and eating disorder symptomatology. *Frontiers in Psychology*, *4*, 887.

II/Table 1.

Sociodemographic Characteristics of Participants

Characteristics	*N*	%	*M*	*SD*
Total sample	3733	100		
Gender				
Men	1801	48.24		
Women	1932	52.75		
Marital Status				
Single	2103	56.33		
Married	1504	40.28		
Widow	10	0.26		
Divorced	86	2.30		
Age				
23-29	957	25.2	23	4.74
29-33	1133	29.8		
34-39	1683	44.3		
Highest level of education				
Primary school	3	1		
Vocational school 1-3 grades	144	3.8		
Vocational school 4-5 grades	779	20.5		
Vocational high school	1161	30.5		
High school	701	18.4		
Higher vocational education after high school graduation,	291	7.7		
Higher vocational education, higher technical school (not college)	114	3.0		
College, BA/BSc education	425	11.2		
College, MA/MSc or undivided (integrated) education	128	3.4		
Post-graduate education, doctoral school (PhD, DLA)	17	4		

Note. M = mean, *SD* = standard deviation, N = sample size, %= percentage.

II/Table 2.

Reliability Indices, Comparisons of Men's and Women's Pornography Use Frequency, Masturbation Frequency, and Body Dissatisfaction

Measures	Range	ω	α	Total sample (N=3733) *M* (SD)	(1) Men (n=1801) *M* (SD)	(2) Women (n=1932) *M* (SD)	*t*	Cohen's d	*p*
1. Pornography use frequency T1[a]	0-10			1.60 (2.33)	2.33 (2.49)	0.92 (1.93)	18.3	0.63	< .001
2. Pornography use frequency T2[a]	0-10			0.71 (1.78)	1.21 (2.21)	0.26 (1.08)	14.1	0.55	< .001
3.Masturbation frequency T1[a]	0-10			2.19 (2.70)	3.04 (2.75)	1.40 (2.39)	18.6	0.63	< .001
4.Masturbation frequency T2[a]	0-10			1.27 (2.37)	1.85 (2.70)	0.76 (1.90)	11.7	0.46	< .001
5. Body dissatisfaction T1[b]	0-5	.84	.84	3.93 (4.51)	2.91 (3.70)	4.86 (4.97)	-12.8	0.44	< .001
6. Body dissatisfaction T2[b]	0-5	.92	.92	3.25 (4.36)	2.82 (4.11)	3.65 (4.55)	-4.72	0.19	< .001

Note. a = 0 = not once in the last year, 1= 1 time, 2 = 2-6 times last year, 3 = 7-11 times last year, 4 = 1 time per month, 5 = 2-3 times a month, 6 = 1 time per week, 7 = 2-3 times a week 8=4-5 times a week, 9 = 6-7 times a week, 10 = more than 7 times a week; b = 0 = never, 1 = rarely, 2 = sometimes, 3 = often, 4 = usually, 5 = always, *M* = mean; *SD* = standard deviation, *t* = t test value, *p*=significance test value; α = Cronbach's alpha; ω = McDonald's omega. **p* < .05. ** *p* < 01

T1 represents the first data collection wave and T2 represents the second data collection wave.

II/Table 3.

Descriptive Statistics, Correlation Between Pornography Use Frequency, Masturbation Frequency and Body Dissatisfaction

Measures	*(Skew)* *(SE)*	Kurt. (*SE*)	Range	M (*SD*)	1	2	3	4	5	6
1. Pornography use frequency T1 [a]	1.21 (0.04)	0.10 (0.08)	0 -10	1.60 (2.33)	1					
2. Pornography use frequency T2 [a]	2.62 (0.04)	6.07 (0.09)	0 -10	0.70 (1.77)	.15**	1				
3. Masturbation frequency T1 [a]	0.68 (0.04)	-1.14 (0.08)	0 -10	2.19 (2.70)	.72**	.13**	1			
4. Masturbation frequency T2 [a]	1.55 (0.04)	0.80 (0.09)	0 -10	1.26 (2.37)	.07**	.58**	.16**	1		
5. Body dissatisfaction T1 [b]	1.21 (0.04)	1.02 (0.08)	0 -10	3.91 (4.51)	.10**	.00	.14**	.00	1	
6. Body dissatisfaction T2 [b]	1.46 (0.04)	1.63 (0.09)	0 – 10	3.27 (4.37)	.07**	.09**	.06**	.09**	.25**	1

Note. Skew. = Skewness; Kurt. = Kurtosis; a = 0 = not once in the last year, 1= 1 time, 2 = 2-6 times last year, 3 = 7-11 times last year, 4 = 1 time per month, 5 = 2-3 times a month, 6 = 1 time per week, 7 = 2-3 times a week 8=4-5 times a week, 9 = 6-7 times a week, 10 = more than 7 times a week; b = 0 = never, 1 = rarely, 2 = sometimes, 3 = often, 4 = usually, 5 = always; M = mean; SD = standard deviation

.

II/Table 4.

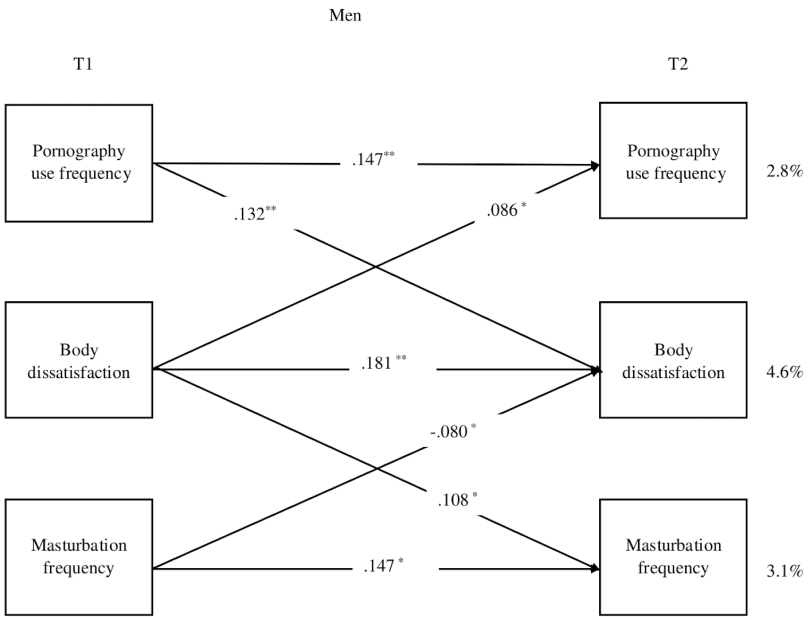
Examination of The Relationship Between Pornography Use Frequency and Perceived Body Dissatisfaction Across Men and Women Individuals Controlling for Masturbation Frequency

Models	**χ^2 (df)**	**CFI**	**TLI**	**RMSEA**	**RMSEA (90% CI)**
Model A: Fully saturated model, no control variable (total sample)	0.000 (0)	1.000	1.000	0.000	0.000-0.000
Model B: Model with control variable (total sample)	0.000 (0)	1.000	1.000	0.000	0.000-0.000
Model C: Fully saturated model, with control variable and grouping by gender	0.000 (0)	1.000	1.000	0.000	0.000-0.000
Model D: Same as Model C, parameters constrained to be equal between groups	382.189 (15)	0.602	0.364	0.115	0.105-0.125

Note. χ2 = Chi-square test; df = degrees of freedom; CFI = comparative fit index; TLI = Tucker–Lewis Index; RMSEA = root-mean-square error of approximation; 90% CI = 90% confidence interval of RMSEA.

II/Figure 1.

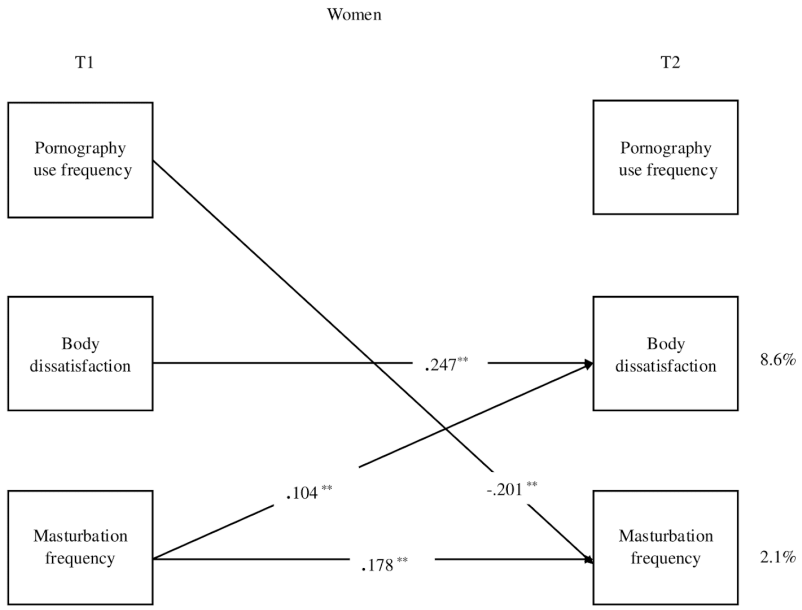
Associations Between Pornography Use Frequency and Body Dissatisfaction Among Men Controlling for masturbation Frequency



Note. Correlations between the variables are not presented to ensure clarity. Only significant associations between T1 pornography use frequency, body dissatisfaction, and masturbation frequency and T2 pornography use frequency, body dissatisfaction, and masturbation are presented for the sake of clarity. Coefficients are standardized regression coefficients. Explained variances of the outcomes are presented on the right side of each variable. T1 represents the first data collection wave and T2 represents the second data collection wave, *p <0.05, **p < 0.01.

II/Figure 2.

Associations Between Pornography Use Frequency and Body Dissatisfaction Among Women Controlling for Masturbation Frequency



Note. Correlations between the variables are not presented to ensure clarity. Only significant associations between T1 pornography use frequency, body dissatisfaction, and masturbation frequency and T2 pornography use frequency, body dissatisfaction, and masturbation are presented for the sake of clarity. Coefficients are standardized regression coefficients. Explained variances of the outcomes are presented on the right side of each variable. T1 represents the first data collection wave and T2 represents the second data collection wave, *p <0.05, **p < 0.01.

III. Bidirectional Positive Associations Between Problematic Pornography Use and Body Dissatisfaction in Women and Men: Findings of a Nationally Representative One-Year Longitudinal Study
(Study 2)

Abstract

Previous studies have established a positive link between pornography use and body dissatisfaction (BD). Nevertheless, previous empirical studies have yielded inconsistent associations between pornography use and BD when taking into account different forms of pornography use (e.g., pornography use frequency or problematic pornography use) or potential gender differences. Given that problematic pornography use (PPU, out-of-control use with negative consequences) differs from general pornography use, the associations between PPU and BD warrant further examination using a longitudinal design and large sample, which the current literature lacks. Given these limitations, this study examined the associations between PPU and BD cross-sectionally and longitudinally in a sample of Hungarian young adults. Among a sample of 2801 adults (M_{age} = 28 years, *SD* = 4.75, 47.69% men and 52.30% women), we performed an autoregressive cross-lagged analysis with a multi-group approach. According to the findings, greater levels of PPU were cross-sectionally associated with higher BD among men and women. Longitudinally, we observed bidirectional positive associations between PPU and BD over time among men and women as well. Based on the present findings, clinicians should implement systematic screening procedures for BD symptoms among individuals exhibiting signs of PPU. Similarly, individuals presenting with BD should be assessed for PPU. This dual-screening approach will enable timely intervention and the development of comprehensive treatment plans.

Keywords: Problematic pornography use, Body dissatisfaction, Longitudinal design, Adults

III/1. Introduction

Recent studies have demonstrated a positive association between the time spent online and body dissatisfaction (BD) among both men and women. For example, previous studies reported that individuals spending 20 hours or more on online social media weekly reported greater BD (Carter et al., 2017). Furthermore, pornography use is one of the online activities that promote unrealistic beauty standards, as it promotes lean and muscular bodies that are far from those of the general population making them difficult for the average individual to achieve (Dawson et al., 2020). Moreover, its intense use may be associated with problematic pornography use (PPU). PPU is defined based on Compulsive Sexual Behavior Disorder (CSBD) symptoms, which comprise (i) intense and poorly controlled pornography use, (ii) numerous failure attempts to reduce or modulate pornography use, and (iii) engaging in pornography use despite its negative effects (World Health Organization, 2018). PPU differs from non-problematic pornography use as it may result in significant impairments (Bőthe et al., 2020). Previous studies have established a positive association between pornography use frequency (i.e., non-problematic pornography use) and BD; however, PPU may be associated with greater BD than pornography use frequency (i.e., non-problematic pornography use) due to excessive exposure to idealized body representations and distress resulting from PPU (McKee et al., 2008). Although the positive link between pornography use and BD is well-established, far less attention has been given to the association between PPU and BD despite preliminary evidence suggesting that PPU (and not PUF) may relate to BD among men (Gewirtz-Meydan et al., 2024). Therefore, the present study aimed to examine how PPU might relate to BD, cross-sectionally and longitudinally, using cross-lagged analysis among men and women in a sample of Hungarian young adults.

Although a universally accepted definition of pornography remains elusive, it can be characterized as sexually explicit material in which individuals deliberately exhibit nudity, with or without sexual acts, intended to elicit sexual arousal (T. Kohut et al., 2020). This sexually explicit material may involve, including but not limited to, oral sex, anal, or vaginal penetration (Reid et al., 2011). Besides its sexual arousal features, pornography may be considered as a form of sexual education (Wright et al., 2022) or material to help individuals discover their sexual orientation (Litsou et al., 2021). However, excessive online pornography use has been often linked to (Camilleri et al.,

2021a) self-perceived pornography addiction or PPU (De Alarcón et al., 2019; Grubbs & Perry, 2019), either due to excessive consumption (Cooper, 1998) or individual characteristics such as moral beliefs (Grubbs & Perry, 2019) or values (Prause, 2019).

PPU is often considered a subtype of CSBD which is more of a state like condition than a trait like indicating its occurrence due to situational factors (Horváth et al., 2025). Although Kafka (2010) proposed the concept of Hypersexual Disorder for inclusion in the Diagnostic and Statistical Manual of Mental Disorders 5th edition (DSM-5), it was ultimately rejected due to a lack of empirical evidence (Reid & Kafka, 2014, American Psychiatric Association, 2013). However, CSBD was included under the impulse control disorder category in the latest edition of the International Classification of Diseases (ICD-11). According to a large-scale study conducted across 42 countries, prevalence estimates for PPU may vary between 3.2% and 16.6% across different subpopulations (Bőthe et al., 2024a). In this study, significant gender differences were observed as men (6.26%) reported higher levels of PPU than women (0.72%).

Previous studies have examined the potential impact of PPU on individuals, focusing on internalizing (e.g., depression, anxiety and self-esteem) and externalizing (e.g., hyperactivity and functionality) comorbid problems associated with PPU. For example, in previous studies, participants with PPU reported higher levels of depression (Bőthe et al., 2020), anxiety (Camilleri et al., 2021a), and stress (Altin et al., 2024) , as well as poor social functioning (Duffy et al., 2016) and relationship anxiety (Leonhardt et al., 2018). Furthermore, although findings are mixed, PPU has been associated with body image concerns in a previous study through body comparison (Gewirtz-Meydan et al., 2024b) among men. However, this association was not significant among women in another study (Borgogna, Lathan, et al., 2018b), highlighting potential gender differences in the associations between PPU and BD.

Body image, as conceptualized by Grogan (2021), encompasses an individual's subjective perceptions, thoughts, and emotions in relation to their own physical appearance and may be characterized by both positive and negative aspects. Positive body image is conceptualized as a multidimensional construct that encompasses acceptance, love, respect, and appreciation of one's body, as well as feeling comfortable with one's physical features (Grogan, 2021; Tylka, 2011). In contrast, those who possess negative body image experience dissatisfaction with their physical appearance and often

perceive discrepancies between their actual and idealized physical appearance (Bucchianeri & Neumark-Sztainer, 2014), resulting in BD.

Pornography typically portrays idealized bodies, featuring performers whose bodily characteristics deviate from reality in terms of body fat, genitals, size, height, and muscularity (Dawson et al., 2020) with greater variability observed in women's representations than men's (McKee et al., 2008). Previous research has shown a positive correlation between pornography use and BD, although the findings have been mixed (Paslakis et al., 2022). Social Comparison Theory (Festinger, 1954) may provide possible explanation for BD associated with pornography use. In accordance with this theory, sense of self is developed through the comparison of the self with other individuals when physical evaluation is not available. Individuals typically assess their own worth through self-evaluation and gain insight into their own social and personal value as a result of their comparison direction, known as upward and downward comparison. Upward comparison is a process by which an individual compares themselves to someone who is superior or better, while downward comparison involves comparing oneself to someone who is lesser or worse. Downward comparison is often used as a strategy to boost self-esteem, as it can make individuals feel better about themselves in comparison to someone else (Tiggemann & Miller, 2010). In the context of PPU, one may spend excessive time on pornography use with uncontrolled consumption resulting in excessive exposure to pornography. Consequently, given that bodies presented are far from reality featuring muscular physiques and larger genitalia, individual may engage in upward comparisons (e.g., observing performers in pornography as more appealing than them), which may result in BD (Gewirtz-Meydan et al., 2024b; McKee et al., 2008).

Despite conflicting findings in the literature, a systematic review conducted by Paslakis et al. (2022) revealed consistent evidence of negative associations between pornography use and body image with important gender differences. Although previous studies have predominantly been conducted among men due to their higher pornography use (Camilleri et al., 2021b), some studies have included women as well. These studies have mainly examined pornography use frequency and PPU separately and have shown that the association between pornography use and BD significantly differed by gender. For men, pornography use has been positively associated with BD. Gay men, for example, reported greater BD symptoms, linked to body comparisons

with pornography actors (Gewirtz-Meydan & Spivak-Lavi, 2023b) and a drive to achieve a muscular physique (Morrison et al., 2007). Pornography use was further associated with men's preferences for romantic partners, favoring individuals resembling pornography actors (Leickly et al., 2017). Notably, when examining both pornography use frequency and PPU among men, significant positive associations with BD were observed only for PPU, not for pornography use frequency (Gewirtz-Meydan et al., 2024c; Gewirtz-Meydan & Spivak-Lavi, 2023a).

Among women, in contrast to men, PPU was not significantly associated with BD (Borgogna, Lathan, et al., 2018b). Regarding pornography use rather than PPU, similar negative patterns have been observed among women as among men. For example, women often perceived the bodies in pornography as unattainable for the average person (Dawson et al., 2020) and believed that pornography distorted perceptions of ideal attractiveness (Mattebo, 2014), contributing to BD. Furthermore, women engaging in pornography use reported higher levels of BD (Dogan & Yassa, 2019a) although the association between pornography use and BD decreased with maturity and sexual experience (A. C. Davis et al., 2019). In addition to overall BD, some studies have examined sexual BD. For example, men reported greater penis size dissatisfaction, while women did not report breast size dissatisfaction, indicating a gendered pattern in sexual BD (Cranney, 2015). Conversely, a study has identified a positive association between pornography use and BD, as both men and women reported that frequent engagement in pornography use resulted in perceiving pornography as more realistic, which, in turn, was associated with more positive body image perceptions (Vogels, 2018a). Finally, several studies reported no significant associations between pornography use and BD, including the only longitudinal study in adults on this topic (Peter and Valkenburg, 2014, Laemmle-Ruff et al., 2019, Borgogna et al., 2018); indicating mixed findings.

Prior studies exploring the associations between pornography use and body image has typically focused on non-problematic use, which may not entail the whole spectrum of pornography use as the mere frequency of use is insufficient to identify problematic use (Bőthe et al., 2020; Chen et al., 2022). To the best of our knowledge only two studies examined the association between PPU and BD, (Gewirtz-Meydan et al., 2024d; Gewirtz-Meydan & Spivak-Lavi, 2023b). As mentioned above, only PPU was positively associated with BD not pornography use frequency in these studies.

They interpreted these as a consequence of shame, guilt, and self-criticism, as well as neurotic tendencies associated with PPU. Although this study provides support for the association between PPU and BD, it is not without notable limitations. For instance, the sample used is a convenience sample comprised only of men, and the data is cross-sectional, limiting the generalizability of the findings and understanding of the directionality of the associations between PPU and BD (e.g., whether prior PPU may result in BD, or whether prior BD may relate to later higher levels of PPU).

Previous studies have also primarily used cross-sectional designs, with the exception of one study (Peter & Valkenburg, 2014) and, this only longitudinal study relied on a single item to measure both overall BD and pornography use. However, single-item measurements may not capture the complex nature of variables of interest and multi-item measurement scales are recommended to better capture the nuances of the variables of interest (G. G. Fisher et al., 2016; T. Kohut et al., 2020). In addition, existing studies had small sample sizes and thus were not necessarily representative of the general population (Borgogna, Lathan, et al., 2018b). Finally, in the existing studies, the majority of studies have focused on men, examining both problematic and non-problematic pornography use (Gewirtz-Meydan et al., 2024b; Paslakis et al., 2022), which makes it impossible to generalize the findings to other populations (e.g., women).

III/1.1. The present study

Considering these various limitations, the present study aimed to examine the cross-sectional and longitudinal associations between PPU and BD among a sample of Hungarian young adults. We hypothesized that PPU would be positively associated with BD both cross-sectionally and longitudinally at one-year follow-up. Gender differences were examined in an exploratory manner due to the conflicting findings.

III/2. Method

III/2.1. Participants

A total of 2801 individuals participated in the study (M_{age} = 28 years, SD = 4.75). The sample comprised a near-equal proportion of men and women, with a slightly larger number of women participants, totaling 1336 men (47.69%) individuals, compared to 1465 (52.30%) women. Sociodemographic information is presented in Table 3.

III/2.2. Procedure

In the present study, we used data from the Budapest Longitudinal Study (BLS). The BLS is a longitudinal study that focuses on addictions and problematic behaviors, such as gaming disorder, gambling disorder, compulsive sexual behaviors, and other substance addictions (e.g., alcohol and exercise) among adults (18-34 years old) in the capital city of Hungary (Budapest). The target group of the initial sample was the young adult population aged 18-34 years old with a valid Budapest address (321,974 persons) according to the registration of the Ministry of the Interior as of 1 January 2019. The sample was selected using a single-stage random sampling procedure stratified by age groups (18-24 and 25-34, i.e. born between 1994-2000 and 1984-1993) and districts. The first wave of the BLS took place in 2019 and for the present study we used only second and third waves which was collected between June and September 2020 and June and November 2021 as our variables of interest were included since second data collection (see Supplementary Fig.1.). The data collection process for both waves involved conducting face-to-face interviews with self-report questionnaires or online interviews with self-report questionnaires based on the availability of the participants. Considering the sensitive nature of the survey items, to mitigate social desirability bias, we used a mixed interviewing technique, combining face-to-face interviewing with self-completion elements. This was done in such a way that the sensitive questions (e.g., questions on behavioral addictions) were self-administered during the interview. The self-completed questions were filled in by the respondent and handed to the interviewer in a sealed envelope. At the same time, the presence of the interviewer ensured the standardization of the interview conditions (e.g., the respondent did not complete the questionnaire with family members).

In the first wave of the data collection, 2744 participants attended in person, while 57 participants participated through online interviews. In the second wave, 2867 participants attended in person, with 7 participants participating via online interviews. Furthermore, only participants who completed the questionnaires in both waves were included in our analysis. Consequently, 2801 participants were included in the present study. Prior to conducting the main analysis, we assessed the normal distribution of all study variables by evaluating skewness and kurtosis. We considered skewness values between -2 and +2 and kurtosis values ranging from -7 to +7 as indicative of an acceptable level of normality. According to Hair and Bryne, the normality assumption is

fulfilled when the skewness coefficient is within the range of ±2, and the kurtosis coefficient is within the range of ±7 (Black et al., 2010) (see Table 2). Participants were provided with a 1000 HUF (3$) shopping voucher and a mug with the study logo as incentives. Prior to the initiation of data collection, all participants provided their consent to participate in the research. The study protocol for the BLS was approved by the Research and Ethical Committee of the Medical Research (no. 60471–2/2018/EKU). The analysis codes were uploaded in Open Science Framework (OSF; LINK). However, due to the confidential nature of the information and the fact that participants were not informed about the potential for their data to be shared publicly, we chose not to upload the dataset to OSF.

III/2.3. Measures

Sociodemographic information was measured using single, researcher created items as follows. Participants responded to a single item that assessed their on sex/gender[1]: "Sex of the respondent ," age: "In what year were you born?", and marital status: "What is your current official marital status?", education level: "What is your highest level of education?", socioeconomic status: "All in all, in your opinion, how good conditions do you / your family have compared to others?".

PPU was measured using the Problematic Pornography Consumption Scale-Short Version (PPCS-6) (Bőthe et al., 2018; Bőthe, Tóth-Király, Demetrovics, et al., 2021). The PPCS-6 measures PPU with six items. Participants rated the items on (e.g., "I felt that porn is an important part of my life) a seven-point Likert scale ranging from 1 (never) to 7 (all the time). The total score ranges from 6 to 42 points. A score of ≥ 20 points on the PPCS-6 indicates a risk of PPU. However, in our analysis, we computed mean scores instead of sum scores in SPSS, resulting in a score range from 1 to 7. Higher scores are an indicator of higher levels of PPU. Previous studies using PPCS-6 reported strong validity in differentiating participants with PPU and non-PPU among Hungarian and international samples (Bőthe et al., 2023; Bőthe, Nagy, Koós, et al., 2024; Bőthe, Tóth-Király, Demetrovics, et al., 2021). In the present study, we used Hungarian version of PPCS-6. Those participants naturally missing data on the PPCS-6 who did not use pornography in the past year (T1: *n*=,78.4%; T2: *n*=,82.6.4%) were recoded as "never" on all PPCS-6 items for subsequent analyses, as was done in

[1] The survey was conducted in Hungarian, a language which does not include a clear differentiation between sex and gender (i.e., the word used in the Hungarian survey was "nem").

previous studies (e.g., Bothe et al., 2022). According to a reliability generalization meta-analysis study of the PPCS, the average Cronbach's alpha score of the PPCS was .91, indicating excellent internal consistency (Demirgül et al., 2024). In our sample, at T1 and T2, the PPCS- 6 showed excellent reliability (T1: α = .93, ω = .93; T2: α = .94, ω = .94). The Hungarian version of the scale is presented in Appendix 3.1.

BD was measured using the BD subscale of the Body Attitude Test (BAT; Probst et al., 1995). The BAT is a self-report instrument that assesses an individual's perception about their body. In the present study, we used the Hungarian version of the BAT. According to previous findings, the Hungarian version of the BAT demonstrated strong reliability and validity in distinguishing between individuals with BD and without BD among diverse Hungarian samples (Czeglédi et al., 2010; Edit et al., 2010). This subscale consists of four items (e.g., "When I look at myself in the mirror, I am dissatisfied with my own body."). In the present study, at T1 and T2, the subscale of BAT measuring BD had excellent reliability (T1: α = .92, ω = .92; T2: α = .95, ω = .95). The Hungarian version of the scale is presented in Appendix 3.2.

III/2.4. Statistical analysis

We computed descriptive statistics, correlations among variables, reliability indices (i.e., McDonald's omega and Cronbach's alpha) and normality indices using SPSS 26, (see Table 2). We performed our main analysis using Mplus 8.7. The outcome variable (PPU) did not meet the assumption of normality, as indicated by skewness and kurtosis values exceeding the threshold for skewness (±2) and kurtosis (±7). Therefore, we used the robust Maximum Likelihood (MLR) estimation, which provides standard errors and chi-square statistics robust to non-normality. When examining gender-based differences in PPU and BD, we conducted independent samples t-tests for data that followed a normal distribution (i.e., BD) and performed the Mann-Whitney U test for non-normally distributed data (i.e., PPU). We performed auto-regressive cross-lagged models to examine the association between PPU and BD. In interpreting our findings, we relied on Cohen's (1988) effect size criteria for group differences and Orth et al.'s (2024) criteria for cross-lagged associations. We tested the adequacy of the model fit with the goodness of fit indices (Brown, 2015), including the Comparative Fit Index (CFI; ≥0.90 for acceptable; ≥0.95 for excellent), Root-Mean-Square Error of Approximation (RMSEA; ≤0.06 for good, ≤0.08 for acceptable), and Tucker Lewis Index (TLI; ≥0.95 for good, ≥0.90 for acceptable (Brown, 2015).

Moreover, a previous study has shown that traditional techniques, such as listwise or pairwise deletion, are inadequate and inappropriate for handling missing data when 10% or more of the respondent sample consists of partial responders (Newman, 2014). Therefore, as traditional techniques may introduce biases, the Full Information Maximum Likelihood (FIML) is recommended to be used as it outperforms other approaches when missingness exceeds 10%. Given that our missing data was more than 10% (ranging between 30% to 33% in T1 and 28% to 31% in T2), we used the FIML method to handle missing data. To apply the FIML method for handling missing data, first, we determined the type of missing data among men and women separately. Both for men (χ^2 (25) = 31.343, p = .178) and women (χ^2 (27) = 17.252, p = .925), Little's MCAR test indicated that missing data was completely at random allowing us to apply the FIML method to handle our missing data (Enders & Bandalos, 2001; Newman, 2014). Initially, we examined the associations between PPU and BD in the total sample (Model A). Next, we examined the gender differences by adding participant's gender as a grouping variable (i.e., men vs. women) into the model and performed a multi-group analysis to examine gender differences in the association between PPU and BD (Model B). Subsequently, we constrained the paths to be equal across all groups (Model C). Finally, we compared Models B and C, which represented the unconstrained and constrained models, respectively, to determine whether gender differences were present in the paths by analyzing the changes in chi-square, CFI, TLI, and RMSEA values. A significant corrected chi-square difference test, significant decreases in CFI and TLI ($\Delta CFI \leq 0.010$; $\Delta TLI \leq 0.010$), and significant increases in RMSEA ($\Delta RMSEA \leq 0.015$) (Bőthe et al., 2021c; Chen, 2007; Cheung & Rensvold, 2002) indicated whether the constrained and unconstrained models differed significantly (i.e., whether the associations differed significantly between men and women).

III/3. Results

III/3.1. Descriptive results of problematic pornography use and body dissatisfaction for men and women

To assess gender differences, an independent samples t-test was applied to normally distributed variable (i.e., BD), while the non-normally distributed variable (i.e., PPU) was analyzed using the Mann–Whitney U test. According to our findings, PPU differed significantly among men and women. Men reported higher levels of PPU

both at T1 (*M* = 1.14, *SD* = 0.54, Cohen's *d* = 0.20) and T2 (*M* = 1.09, *SD* = 0.45, Cohen's *d* = 0.08) than women at T1 (*M* = 1.04, *SD* = 0.32) and T2 (*M* = 1.05, *SD* = 0.42). Similarly, we observed significant gender differences in BD. At T1, women reported greater BD (*M* = 3.94, *SD* = 4.53, Cohen's *d* = 0.20) than men (*M* = 3.07, *SD* = 4.15), and at T2, men reported greater BD (*M* = 5.26, *SD* = 4.66, Cohen's *d* = 0.11) than women (*M* = 4.66, *SD* = 5.34).

To examine the bivariate associations between the variables, we conducted Spearman's correlation. The findings revealed that all correlations between PPU and BD were statistically significant, showing positive associations with a weak effect size (*r* ranging between .15 to .19 *p*s < .001).

III/3.2. Cross-sectional and longitudinal associations between problematic pornography use and body dissatisfaction

The latent variable models provided excellent fit to the data, as presented in Table 3.4. To examine whether the association between PPU and BD differed between men and women, we compared the constrained model (Model C) to the unconstrained model (Model B) (ΔCFI = 0.005; ΔTLI = 0.002; ΔRMSEA = 0.001). The Chi-square difference test revealed a statistically significant result (Δχ2 = 56,968; $p < 0.001$). The findings demonstrated that the associations between PPU and BD exhibit significant differences between men and women. Hence, we reported Model B and presented in Figure. 3. and 3.1, separately for men and women.

Among men, higher levels of T1 PPU were associated with higher levels of T1 BD with a large effect size *(r* = .21, 95% CI [.15, .27], $p < 0.001$). T2 PPU was not significantly associated with T2 BD *(r* = .03, 95% CI [< .001, .078], $p = .110$). Longitudinally, higher levels of T1 PPU were associated with higher levels of T2 PPU with a large effect ($\beta = .43$, 95% CI [.28, .57], $p < 0.001$). Higher levels of T1 BD were associated with higher levels of T2 PPU with a medium to large effect ($\beta = .10$, 95% CI [.03, .15], $p = .002$). Higher levels of T1 BD were associated with higher levels of T2 BD with a large effect *(*$\beta = .35$, 95% CI [.29, .41], $p < 0.001$). Higher levels of T1 PPU were associated with higher level of T2 BD with a medium to large effect ($\beta = .11$, 95% CI [.06, .16], $p < 0.001$).

Among women, higher levels of T1 PPU were associated with higher levels of T1 BD with a large effect *(r* = .19, 95% CI [.13, .25], $p < 0.001$). Higher levels of T2 PPU were associated with higher levels of T2 BD with a medium to large effect *(r* =

.10, 95% CI [.04, .16], $p < 0.001$). Longitudinally, higher levels of T1 PPU were associated with higher levels of T2 PPU ($\beta = .23$, 95% CI [.05, .40], $p = .010$) with a large effect. Higher levels of T1 BD were associated with higher levels of T2 PPU with a large effect ($\beta = .13$, 95% CI [.04, .20], $p = .002$). Higher levels of T1 BD were associated with higher levels of T2 BD with a large effect ($\beta = .45$, 95% CI [.40, .50], $p < 0.001$). Higher levels of T1 PPU were associated with higher levels of T2 BD with a medium effect ($\beta = .08$, 95% CI [.02, .14], $p = .008$).

III/4. Discussion

Previous studies have documented a positive association between pornography use and BD (Paslakis et al., 2022). However, these studies have either been short-term studies (e.g., covering 6 months) (Peter & Valkenburg, 2014) or have neglected the potential association between PPU and BD as they mostly focused on the association between pornography use frequency and BD (Cranney, 2015; Paslakis et al., 2022). Although the optimal time interval between waves is not known, a minimum of one year has been recommended to ensure robust prediction in longitudinal studies, (White & Arzi, 2005). Thus, in the present study, we aimed to address this knowledge gap by examining the association between PPU and BD over one year using a cross-lagged analysis among a sample of Hungarian young adults, considering potential gender differences. According to the present findings, greater baseline PPU was associated with greater BD one year later, and similarly, greater baseline BD was associated with greater PPU one year later among men and women as well.

Regarding the cross-sectional findings, at baseline, PPU demonstrated a positive association with BD. At the one-year follow-up, this association was only significant for women. Regarding longitudinal findings, we observed that PPU at baseline had a positive cross-lagged association with BD at the one-year follow-up among men and women, as well, supporting our hypothesis. Similarly, baseline BD had a positive cross-lagged association with PPU one year later. These results indicate a potentially bidirectional association between PPU and BD among both genders, with significant gender differences, as this association was stronger among men.

Our study was conducted on the basis of social comparison theory, which was first proposed by Festinger (1954), where one tends to compare themselves to others when objective measures are not available. Given that pornography depicts muscular and lean bodies which are idealized (McKee et al., 2008), one may engage in such a

comparison, and these comparisons may result in reduced self-rating. Thus, our findings that PPU was associated with BD is supported by this theoretical model. Moreover, previous studies have linked PPU with self-criticism (Sassover et al., 2023). Given that self-criticism is associated with attaining higher goals and feelings of disappointment, in the context of the PPU and BD association, this phenomenon may be attributed to individuals engaging in excessive upward social comparisons and their inability to achieve higher goals (e.g., idealized bodies), and it may result in BD (Blatt et al., 1976; Festinger, 1954). Furthermore, regarding PPU, rather than pornography use in general, individuals may prefer more extreme pornographic content as a result of desensitization (Binnie & Reavey, 2020). Therefore, those with PPU may be more exposed to exaggerated representations of unrealistic body images, potentially skewing their perception of what a "normal" body looks like. This extremity in content, along with excessive use and exaggerated body representations in pornography, may help explain the association between PPU and BD. Our findings and assumptions extend those of previous studies, suggesting that PPU may be associated with greater BD symptoms, particularly through social comparison, among both men and women (Gewirtz-Meydan et al., 2024b).

Concerning gender differences, women who engaged in pornography use reported greater negative sexual body image (Dogan & Yassa, 2019b) due to exposure to female genitalia (Sharp et al., 2016). In another study, women with higher pornography use reported increased breast size dissatisfaction; however, overall BD was not significantly associated with pornography use (Peter & Valkenburg, 2014). In the case of men, pornography use was associated not only with overall BD (Whitfield et al., 2018) but also with genital dissatisfaction. Moreover, some studies have observed that the frequency of pornography use was negatively related to the perception of the range of normal penis size (Sharp & Oates, 2019b), resulting in dissatisfaction with one's own penis size (Cranney, 2015). Nevertheless, in contrast to these studies demonstrating a positive association between pornography use and BD, other studies reported no significant associations between pornography use frequency and BD (Duggan & McCreary, 2004; Gewirtz-Meydan et al., 2024b; Gleason & Sprankle, 2019; Sevic et al., 2020) among men as well as between PPU and BD among women (Borgogna, Lathan, et al., 2018b).

Furthermore, the present study's findings also suggested that higher BD levels were associated with higher PPU levels one year later. Several factors could explain these results. For example, individuals with BD reported greater dating and interpersonal anxiety; therefore, these individuals may prefer pornography over real-life sexual experiences (Swami et al., 2021), and excessive use may result in PPU in some cases (Kraus et al., 2018). Moreover, sexual self-efficacy and increased sexual anxiety may be a result of perceived BD, potentially leading individuals with BD to abstain from real-life sexual experiences (Blashill et al., 2016; van den Brink et al., 2018) and chose more solitary sexual activities such as pornography. This longitudinal positive association between BD and PPU is a novel finding, as no longitudinal study to date has examined this association among men and women as well.

Although significant gender differences were established in the literature, with women exhibiting greater BD (Esnaola et al., 2010; Quittkat et al., 2019), the association between PPU and BD among men was stronger than among women in the present study. However, when it comes to BD predicting PPU over time, this association was slightly stronger among women compared to men. This finding suggests that PPU may have a stronger association with BD among men, whereas for the reverse association (i.e., the path from BD to PPU over time), women may be slightly more prone to engage in PPU due to their BD. However, the difference between men and women's T1 BD and T2 PPU was very small (i.e., men's β: .10; women's: β .13). This stronger association of men's T1 PPU and T2 BD may be due to pornography's presentation of more extreme idealized bodies in men than women (Rothman, 2021), prompting men to engage more in upward comparisons thus increasing their BD more than women. These differences may also be attributed to men's greater tendency to internalize and perceive realistic body representations in pornography (Peter & Valkenburg, 2014), whereas women may demonstrate a more critical approach in differentiating between normative and unrealistic body proportions (Doornwaard et al., 2014).

III/4.1. Study limitations and future research

This study is the first longitudinal one examining the associations between PPU and BD considering gender differences among a sample of Hungarian young adults. Despite filling an important gap in the literature, this study had several limitations that should be taken into consideration when interpreting the results. Firstly, the study used

self-report measures, indicating possible response bias as pornography may be a stigmatized behavior (Štulhofer et al., 2022). We believed that women may be more likely to engage in

Secondly, we did not include a definition of pornography that might have introduced some biases (Kohut et al., 2020). Thirdly, although we used a longitudinal design, we cannot establish causal relationships between the study variables. Fourthly, amateur and professional pornography differ in terms of the bodies presented, which may have an impact on an individual's degree of perceived BD, yet, the present study did not measure the types of pornography preferred by the users (Kvalem et al., 2016). Fifthly, to measure BD, we employed the BD subscale of Body Attitude Test (BAT; Probst et al., 1995). As BD is a complex multidimensional construct encompassing various features associated with the body, such as physical appearance, muscularity, and weight. While using a four-item scale is efficient, it may inadequately capture distinct features associated with more comprehensive aspects of BD's relationship with PPU. For example, pornography use may not only be associated with overall BD but is also associated with sexual BD, such as penis size or breast size (Peter & Valkenburg, 2014; Sharp & Oates, 2019). Thus, using a four-item scale focusing only on overall BD may limit our understanding of the association between specific body parts and PPU. Sixthly, considering the sensitive and stigmatized nature of the topic, it is important to acknowledge that the use of pornography-related questionnaires may introduce some bias, even though we conducted face-to-face interviewing with self-completion elements. Finally, an additional important limitation is that BD and PPU vary significantly depending on sexual orientation; we did not measure sexual orientation of the participants (Gewirtz-Meydan et al., 2024; Gewirtz-Meydan & Spivak-Lavi, 2023b), which limits the generalizability of the study’s findings. Future research should examine potential additional variables, such as internalization of bodies, that may explain the association between PPU and BD. Additionally, future studies should explore longer timeframes (e.g., three years) to gain a more comprehensive understanding of the associations between BD and PPU over time.

III/5. Conclusion

Although an association between pornography use and BD has often been examined in the literature (Paslakis et al., 2022), only two cross-sectional studies have assessed the association between PPU and BD and they only focused on men (Gewirtz-

Meydan et al., 2023, 2024), limiting the generalizability of their findings. Thus, we examined the cross-sectional and longitudinal associations between PPU and BD in a sample of Hungarian young men and women over one year. The findings showed that PPU and BD were positively associated cross-sectionally and longitudinally with a medium to large effect among both men and women. Importantly, the longitudinal associations between BD and PPU were bidirectional. Nevertheless, these longitudinal findings should be interpreted with caution, as causal inferences cannot be drawn from the present study. Given that a bidirectional association was observed, clinicians treating PPU should consider BD symptoms and vice versa; therefore, addressing one may positively contribute to the other. Moreover, mental health professionals may integrate screening tools both addressing BD and PPU to develop more comprehensive treatment plans when individuals seek help for PPU and/or BD.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

No potential conflict of interest was reported by the author(s).

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. BB was supported by the FRQSC – Research Support for New Academics (NP) Program (https://doi.org/10.69777/343918). BB is a researcher of the Centre de Recherche Interdisciplinaire sur les Problèmes Conjugaux et les Agressions Sexuelles, supported by the FRQSC - Regroupements stratégiques / Centre - fonctionnement (https://doi.org/10.69777/281155).

Ethical permission statement

This work was supported by the Research and Ethical Committee of the Medical Research (no. 60471–2/2018/EKU).

Consent Statement

Prior to the initiation of data collection, all participants provided their consent to participate in the research.

Data availability statement

The data analysis for the present work are available at the following OSF link (LINK). Data that support the findings of this study is available on request.

III/6. References

Ackard, D. M., Kearney-Cooke, A., & Peterson, C. B. (2000). Effect of body image and self-image on women's sexual behaviors. *International Journal of Eating Disorders*, *28*(4), 422–429.

Afshari, P., Houshyar, Z., Javadifar, N., Pourmotahari, F., & Jorfi, M. (2016). The relationship between body image and sexual function in middle-aged women. *Electronic Physician*, *8*(11), 3302.

Alliston, A. (2020). Pornography. In *Oxford Research Encyclopedia of Literature*.

Altin, M., De Leo, D., Tribbia, N., Ronconi, L., & Cipolletta, S. (2024). Problematic Pornography Use, Mental Health, and Suicidality among Young Adults. *International Journal of Environmental Research and Public Health*, *21*(9), 1228.

Antons, S., & Matthias, B. (2020). Inhibitory control and problematic Internet-pornography use–The important balancing role of the insula. *Journal of Behavioral Addictions*, *9*(1), 58–70.

Baltazar, A., Helm, H. W., Mcbride, D., Hopkins, G., & Stevens, J. V. (2010). Internet Pornography use in the Context of External and Internal Religiosity. *Journal of Psychology and Theology*, *38*(1), 32–40.

Barakat, S., McLean, S. A., Bryant, E., Le, A., Marks, P., Touyz, S., & Maguire, S. (2023). Risk factors for eating disorders: Findings from a rapid review. *Journal of Eating Disorders*, *11*(1), 8.

Bingham, J. E., & Piotrowski, C. (1996). On-line sexual addiction: A contemporary enigma. *Psychological Reports*, *79*(1), 257–258.

Binnie, J., & Reavey, P. (2020). Problematic pornography use: Narrative review and a preliminary model. *Sexual and Relationship Therapy*, *35*(2), 137–161.

Blashill, A. J., Tomassilli, J., Biello, K., O'Cleirigh, C., Safren, S. A., & Mayer, K. H. (2016). Body dissatisfaction among sexual minority men: Psychological and sexual health outcomes. *Archives of Sexual Behavior*, *45*, 1241–1247.

Blatt, S. J., D'Afflitti, J. P., & Quinlan, D. M. (1976). Experiences of depression in normal young adults. *Journal of Abnormal Psychology*, *85*(4), 383.

Bonfanti, R. C., Melchiori, F., Teti, A., Albano, G., Raffard, S., Rodgers, R., & Coco, G. L. (2025). The association between social comparison in social media, body

image concerns and eating disorder symptoms: A systematic review and meta-analysis. *Body Image*, *52*, 101841.

Borgogna, N. C., & Aita, S. L. (2019). Problematic Pornography Viewing from a Big-5 Personality Perspective. *Sexual Addiction & Compulsivity*, *26*(3–4), 293–314.

Borgogna, N. C., Duncan, J., & McDermott, R. C. (2018). Is scrupulosity behind the relationship between problematic pornography viewing and depression, anxiety, and stress? *Sexual Addiction & Compulsivity*, *25*(4), 293–318.

Borgogna, N. C., Lathan, E. C., & Mitchell, A. (2018). Is women's problematic pornography viewing related to body image or relationship satisfaction? *Sexual Addiction & Compulsivity*, *25*(4), 345–366.

Bőthe, B., Demirgül, S. A., & Demetrovics, Z. (2023). Problematic Pornography Consumption Scale (PPCS). In C. U. Krägeloh, M. Alyami, & O. N. Medvedev (Eds.), *International Handbook of Behavioral Health Assessment* (pp. 1–16). Springer International Publishing.

Bőthe, B., Nagy, L., Koos, M., Demetrovics, Z., Potenza, M. N., International Sex Survey Consortium, Kraus, S. W., Demirgül, S. A., Gaudet, É., & Ballester-Arnal, R. (2024). Problematic pornography use across countries, genders, and sexual orientations: Insights from the International Sex Survey and comparison of different assessment tools. *Addiction*, *119*(5), 928–950.

Bőthe, B., Nagy, L., Koós, M., Demetrovics, Z., Potenza, M. N., International Sex Survey Consortium, Kraus, S. W., Demirgül, S. A., Gaudet, É., & Ballester-Arnal, R. (2024). Problematic pornography use across countries, genders, and sexual orientations: Insights from the International Sex Survey and comparison of different assessment tools. *Addiction*.

Bőthe, B., Tóth-Király, I., Bella, N., Potenza, M. N., Demetrovics, Z., & Orosz, G. (2021a). Why do people watch pornography? The motivational basis of pornography use. *Psychology of Addictive Behaviors*, *35*(2), 172.

Bőthe, B., Tóth-Király, I., Bella, N., Potenza, M. N., Demetrovics, Z., & Orosz, G. (2021b). Why do people watch pornography? The motivational basis of pornography use. *Psychology of Addictive Behaviors*, *35*, 172–186.

Bőthe, B., Tóth-Király, I., Demetrovics, Z., & Orosz, G. (2021). The short version of the problematic pornography consumption scale (PPCS-6): A reliable and valid

measure in general and treatment-seeking populations. *The Journal of Sex Research*, *58*(3), Article 3.

Bőthe, B., Tóth-Király, I., & Orosz, G. (2015). Clarifying the Links Among Online Gaming, Internet Use, Drinking Motives, and Online Pornography Use. *Games for Health Journal*, *4*(2), 107–112.

Bőthe, B., Toth-Kiraly, I., Potenza, M. N., Griffiths, M. D., Orosz, G., & Demetrovics, Z. (2019). Revisiting the role of impulsivity and compulsivity in problematic sexual behaviors. *The Journal of Sex Research*, *56*(2), 166–179.

Bőthe, B., Tóth-Király, I., Potenza, M. N., Orosz, G., & Demetrovics, Z. (2020). High-frequency pornography use may not always be problematic. *The Journal of Sexual Medicine*, *17*(4), 793–811.

Bőthe, B., Tóth-Király, I., Zsila, Á., Griffiths, M. D., Demetrovics, Z., & Orosz, G. (2018). The development of the problematic pornography consumption scale (PPCS). *The Journal of Sex Research*, *55*(3), Article 3.

Bucchianeri, M. M., & Neumark-Sztainer, D. (2014). Body dissatisfaction: An overlooked public health concern. *Journal of Public Mental Health*, *13*(2), 64–69.

Burckhardt, J. (1860). *Civilization of the Renaissance in Italy London*.

Butler, M. H., Pereyra, S. A., Draper, T. W., Leonhardt, N. D., & Skinner, K. B. (2018). Pornography Use and Loneliness: A Bidirectional Recursive Model and Pilot Investigation. *Journal of Sex & Marital Therapy*, *44*(2), 127–137.

Buunk, A. P., & Gibbons, F. X. (2006). Perspective on those who do and those who don't compare with others. *Social Comparison and Social Psychology: Understanding Cognition, Intergroup Relations, and Culture*, 15.

Camilleri, C., Perry, J. T., & Sammut, S. (2021a). Compulsive internet pornography use and mental health: A cross-sectional study in a sample of university students in the United States. *Frontiers in Psychology*, *11*, 613244.

Camilleri, C., Perry, J. T., & Sammut, S. (2021b). Compulsive internet pornography use and mental health: A cross-sectional study in a sample of university students in the United States. *Frontiers in Psychology*, *11*, 613244.

Cardoso, J., Ramos, C., Brito, J., & Almeida, T. C. (2022). Predictors of pornography use: Difficulties in emotion regulation and loneliness. *The Journal of Sexual Medicine*, *19*(4), 620–628.

Carnes, P., Green, B., & Carnes, S. (2010). The same yet different: Refocusing the Sexual Addiction Screening Test (SAST) to reflect orientation and gender. *Sexual Addiction & Compulsivity*, *17*(1), 7–30.

Carter, A., Forrest, J. I., & Kaida, A. (2017). Association between internet use and body dissatisfaction among young females: Cross-sectional analysis of the Canadian community health survey. *Journal of Medical Internet Research*, *19*(2), e39.

Cassin, S. E., & von Ranson, K. M. (2005). Personality and eating disorders: A decade in review. *Clinical Psychology Review*, *25*(7), 895–916.

Chen, L., Jiang, X., Luo, X., Kraus, S. W., & Bőthe, B. (2022). The role of impaired control in screening problematic pornography use: Evidence from cross-sectional and longitudinal studies in a large help-seeking male sample. *Psychology of Addictive Behaviors*, *36*(5), 537.

Cohen, J. (1988). *Statistical power analysis*.

Coleman, E. (1991). Compulsive sexual behavior: New concepts and treatments. *Journal of Psychology & Human Sexuality*, *4*(2), 37–52.

Collier, D. A., & Treasure, J. L. (2004). The aetiology of eating disorders. *The British Journal of Psychiatry*, *185*(5), 363–365.

Compan, V., Laurent, L., Jean, A., Macary, C., Bockaert, J., & Dumuis, A. (2012). Serotonin signaling in eating disorders. *Wiley Interdisciplinary Reviews: Membrane Transport and Signaling*, *1*(6), 715–729.

Cooper, A. (1997). The Internet and sexuality: Into the next millenium. *Journal of Sex Education and Therapy*, *22*(1), 5–6.

Cooper, A. (1998). Sexuality and the Internet: Surfing into the new millennium. *CyberPsychology & Behavior*, *1*(2), 187–193.

Cooper, A., Delmonico, D. L., & Burg, R. (2000). Cybersex users, abusers, and compulsives: New findings and implications. *Sexual Addiction & Compulsivity: The Journal of Treatment and Prevention*, *7*(1–2), 5–29.

Cooper, A., Putnam, D. E., Planchon, L. A., & Boies, S. C. (1999). Online sexual compulsivity: Getting tangled in the net. *Sexual Addiction & Compulsivity*, *6*(2), 79–104.

Cooper, A., Scherer, C. R., Boies, S. C., & Gordon, B. L. (1999). Sexuality on the Internet: From sexual exploration to pathological expression. *Professional Psychology: Research and Practice*, *30*(2), 154.

Costanzo, P. R., & Woody, E. Z. (1985). Domain-specific parenting styles and their impact on the child's development of particular deviance: The example of obesity proneness. *Journal of Social and Clinical Psychology*, *3*(4), 425–445.

Crandall, C. S. (1988). Social contagion of binge eating. *Journal of Personality and Social Psychology*, *55*(4), 588.

Cranney, S. (2015). Internet pornography use and sexual body image in a Dutch sample. *International Journal of Sexual Health*, *27*(3), 316–323.

Czeglédi, E., Urbán, R., & Csizmadia, P. (2010). Measuring body image: Psychometric properties and construct validity of the Hungarian version of Body Attitude Test. *Magyar Pszichológiai Szemle*, *65*(3), 431–461.

Dakanalis, A., Zanetti, A. M., Riva, G., Colmegna, F., Volpato, C., Madeddu, F., & Clerici, M. (2015). Male body dissatisfaction and eating disorder symptomatology: Moderating variables among men. *Journal of Health Psychology*, *20*(1), 80–90.

Davis, A. C., Wright, C. J., Temple-Smith, M. J., Hellard, M. E., & Lim, M. S. (2019). A health education website developed to meet young people's information needs about web-based pornography and sharing of sexually explicit imagery (SCOPE): Usability study. *JMIR Formative Research*, *3*(3), e12824.

Davis, L. L., Fowler, S. A., Best, L. A., & Both, L. E. (2020). The Role of Body Image in the Prediction of Life Satisfaction and Flourishing in Men and Women. *Journal of Happiness Studies*, *21*(2).

Dawson, K., Nic Gabhainn, S., & MacNeela, P. (2020). Toward a model of porn literacy: Core concepts, rationales, and approaches. *The Journal of Sex Research*, *57*(1), 1–15.

De Alarcón, R., de la Iglesia, J. I., Casado, N. M., & Montejo, A. L. (2019). Online porn addiction: What we know and what we don't—A systematic review. *Journal of Clinical Medicine*, *8*(1), 91.

Demirgül, S. A., Sancar, I. V., Demetrovics, Z., & Bőthe, B. (n.d.). A Cronbach's Alpha Generalization Meta-Analysis Study of the Problematic Pornography Consumption Scale. *Sexual Health & Compulsivity*, 1–22.

Dogan, O., & Yassa, M. (2019a). Major motivators and sociodemographic features of women undergoing labiaplasty. *Aesthetic Surgery Journal*, *39*(12), NP517–NP527.

Dogan, O., & Yassa, M. (2019b). Major motivators and sociodemographic features of women undergoing labiaplasty. *Aesthetic Surgery Journal*, *39*(12), NP517–NP527.

Donnerstein, E., & Berkowitz, L. (1981). Victim reactions in aggressive erotic films as a factor in violence against women. *Journal of Personality and Social Psychology*, *41*(4), 710.

Doornwaard, S. M., Bickham, D. S., Rich, M., Vanwesenbeeck, I., van den Eijnden, R. J., & Ter Bogt, T. F. (2014). Sex-related online behaviors and adolescents' body and sexual self-perceptions. *Pediatrics*, *134*(6), 1103–1110.

Doornwaard, S. M., van den Eijnden, R. J., Overbeek, G., & ter Bogt, T. F. (2015). Differential developmental profiles of adolescents using sexually explicit internet material. *The Journal of Sex Research*, *52*(3), 269–281.

Dormann, C., & Zapf, D. (2002). Social stressors at work, irritation, and depressive symptoms: Accounting for unmeasured third variables in a multi-wave study. *Journal of Occupational and Organizational Psychology*, *75*(1), 33–58.

Downing Jr, M. J., Antebi, N., & Schrimshaw, E. W. (2014). Compulsive use of Internet-based sexually explicit media: Adaptation and validation of the Compulsive Internet Use Scale (CIUS). *Addictive Behaviors*, *39*(6), 1126–1130.

Duffy, A., Dawson, D. L., & Das Nair, R. (2016). Pornography addiction in adults: A systematic review of definitions and reported impact. *The Journal of Sexual Medicine*, *13*(5), 760–777.

Duggan, S. J., & McCreary, D. R. (2004). Body image, eating disorders, and the drive for muscularity in gay and heterosexual men: The influence of media images. *Journal of Homosexuality*, *47*(3–4), 45–58.

Dukay-Szabó, S., Simon, D., Varga, M., Szabó, P., Túry, F., & Rathner, G. (2016). Egy rövid evészavar-kérdőív (SCOFF) magyar adaptációja. *Ideggyógyászati Szemle*, *69*(3–4).

Edit, C., Róbert, U., & Péter, C. (2010). A testkép mérése: A testi attit\Hudök tesztjének (Body Attitude Test) pszichometriai vizsgálata. *Magyar Pszichológiai Szemle*. https://psycnet.apa.org/record/2010-20909-001

Egan, V., & Parmar, R. (2013). Dirty Habits? Online Pornography Use, Personality, Obsessionality, and Compulsivity. *Journal of Sex & Marital Therapy*, *39*(5), 394–409.

Esnaola, I., Rodríguez, A., & Goñi, A. (2010). Body dissatisfaction and perceived sociocultural pressures: Gender and age differences. *Salud Mental*, *33*(1), 21–29.

Fardouly, J., Diedrichs, P. C., Vartanian, L. R., & Halliwell, E. (2015a). Social comparisons on social media: The impact of Facebook on young women's body image concerns and mood. *Body Image*, *13*, 38–45.

Fardouly, J., Diedrichs, P. C., Vartanian, L. R., & Halliwell, E. (2015b). The mediating role of appearance comparisons in the relationship between media usage and self-objectification in young women. *Psychology of Women Quarterly*, *39*(4), 447–457.

Feltman, C. E., & Szymanski, D. M. (2018). Instagram use and self-objectification: The roles of internalization, comparison, appearance commentary, and feminism. *Sex Roles*, *78*(5), 311–324.

Fernandez, D. P., & Griffiths, M. D. (2021). Psychometric instruments for problematic pornography use: A systematic review. *Evaluation & the Health Professions*, *44*(2), Article 2.

Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, *7*(2), 117–140.

Fischer, S., Stojek, M., & Hartzell, E. (2010). Effects of multiple forms of childhood abuse and adult sexual assault on current eating disorder symptoms. *Eating Behaviors*, *11*(3), 190–192.

Fisher, G. G., Matthews, R. A., & Gibbons, A. M. (2016). Developing and investigating the use of single-item measures in organizational research. *Journal of Occupational Health Psychology*, *21*(1), 3.

Fisher, W. A., & Barak, A. (1991). Pornography, erotica, and behavior: More questions than answers. *International Journal of Law and Psychiatry*, *14*(1–2), 65–83.

Fredrickson, B. L., & Roberts, T.-A. (1997). Objectification theory: Toward understanding women's lived experiences and mental health risks. *Psychology of Women Quarterly*, *21*(2), 173–206.

Gewirtz-Meydan, A., Bőthe, B., & Spivak-Lavi, Z. (2024a). The Associations of Pornography Use and Body Image Among Heterosexual and Sexual Minority Men. *Archives of Sexual Behavior*, 1–14.

Gewirtz-Meydan, A., Bőthe, B., & Spivak-Lavi, Z. (2024b). The Associations of Pornography Use and Body Image Among Heterosexual and Sexual Minority Men. *Archives of Sexual Behavior*, 1–14.

Gewirtz-Meydan, A., Bőthe, B., & Spivak-Lavi, Z. (2024c). The Associations of Pornography Use and Body Image Among Heterosexual and Sexual Minority Men. *Archives of Sexual Behavior*, *53*(9), 3379–3392.

Gewirtz-Meydan, A., & Spivak-Lavi, Z. (2023a). The association between problematic pornography use and eating disorder symptoms among heterosexual and sexual minority men. *Body Image*, *45*, 284–295.

Gewirtz-Meydan, A., & Spivak-Lavi, Z. (2023b). The association between problematic pornography use and eating disorder symptoms among heterosexual and sexual minority men. *Body Image*, *45*, 284–295.

Gleason, N., & Sprankle, E. (2019). The effects of pornography on sexual minority men's body image: An experimental study. *Psychology & Sexuality*, *10*(4), 301–315.

Gola, M., Wordecha, M., Sescousse, G., Lew-Starowicz, M., Kossowski, B., Wypych, M., Makeig, S., Potenza, M. N., & Marchewka, A. (2017). Can pornography be addictive? An fMRI study of men seeking treatment for problematic pornography use. *Neuropsychopharmacology*, *42*(10), 2021–2031.

Goodman, A. (1992). Sexual Addiction: Designation and Treatment. *Journal of Sex & Marital Therapy*, *18*(4), 303–314.

Griffiths, M. (2005). A 'components' model of addiction within a biopsychosocial framework. *Journal of Substance Use*, *10*(4), 191–197.

Grogan, S. (2021). *Body image: Understanding body dissatisfaction in men, women and children*. Routledge.

Grubbs, J. B., Kraus, S. W., & Perry, S. L. (2019). Self-reported addiction to pornography in a nationally representative sample: The roles of use habits, religiousness, and moral incongruence. *Journal of Behavioral Addictions*, *8*(1), 88–93.

Grubbs, J. B., & Perry, S. L. (2019). Moral Incongruence and Pornography Use: A Critical Review and Integration. *The Journal of Sex Research*, *56*(1), 29–37.

Grubbs, J. B., Stauner, N., Exline, J. J., Pargament, K. I., & Lindberg, M. J. (2015). Perceived addiction to Internet pornography and psychological distress:

Examining relationships concurrently and over time. *Psychology of Addictive Behaviors*, *29*(4), 1056.

Grubbs, J. B., Wilt, J. A., Exline, J. J., & Pargament, K. I. (2018). Predicting pornography use over time: Does self-reported "addiction" matter? *Addictive Behaviors*, *82*, 57–64.

Grubbs, J. B., Wilt, J. A., Exline, J. J., Pargament, K. I., & Kraus, S. W. (2018). Moral disapproval and perceived addiction to internet pornography: A longitudinal examination. *Addiction*, *113*(3), 496–506.

Hald, G. M., & Štulhofer, A. (2016). What types of pornography do people use and do they cluster? Assessing types and categories of pornography consumption in a large-scale online sample. *The Journal of Sex Research*, *53*(7), 849–859.

Hardy, S. A., Steelman, M. A., Coyne, S. M., & Ridge, R. D. (2013). Adolescent religiousness as a protective factor against pornography use. *Journal of Applied Developmental Psychology*, *34*(3), 131–139.

Heinberg, L. J. (2001). *Theories of body image disturbance: Perceptual, developmental, and sociocultural factors.*

Herbenick, D., Bowling, J., Fu, T.-C., Dodge, B., Guerra-Reyes, L., & Sanders, S. (2017). Sexual diversity in the United States: Results from a nationally representative probability sample of adult women and men. *PloS One*, *12*(7), e0181198.

Horváth, Z., Bőthe, B., Potenza, M. N., Stein, D. J., Demirgül, S. A., Paksi, B., Czakó, A., & Demetrovics, Z. (n.d.). Compulsive Sexual Behavior May Be More State-Like than Trait-Like: A Latent State-Trait Analysis Among Young Adults from a Three-Year Longitudinal Panel Survey. *Available at SSRN 5183167*.

Hotchkiss, J. T. (2021). The Relationship Between Sexual Compulsivity, Emotional and Spiritual Distress of Religious and Non-religious Internet Pornography Users. *Journal of Religion and Health*, *60*(3), 1630–1651.

Hunt, L. (1993). *The invention of pornography, 1500–1800: Obscenity and the origins of modernity*. MIT Press.

Ince, C., Yucel, M., Albertella, L., & Fontenelle, L. F. (2021). Exploring the clinical profile of problematic pornography use. *CNS SPECTRUMS*, *26*(6, SI), 648–657.

Ioannidis, K., Treder, M. S., Chamberlain, S. R., Kiraly, F., Redden, S. A., Stein, D. J., Lochner, C., & Grant, J. E. (2018). Problematic internet use as an age-related

multifaceted problem: Evidence from a two-site survey. *Addictive Behaviors*, *81*, 157–166.

Ito, R., Robbins, T. W., & Everitt, B. J. (2004). Differential control over cocaine-seeking behavior by nucleus accumbens core and shell. *Nature Neuroscience*, *7*(4), 389–397.

Kafka, M. P. (2010). Hypersexual disorder: A proposed diagnosis for DSM-V. *Archives of Sexual Behavior*, *39*(2), Article 2.

Kafka, M. P. (2014). What happened to hypersexual disorder? *Archives of Sexual Behavior*, *43*(7), 1259–1261.

Kohut, T. A. (2014). *An empirical investigation of the concept of "pornography."* The University of Western Ontario (Canada).

Kohut, T., Balzarini, R. N., Fisher, W. A., Grubbs, J. B., Campbell, L., & Prause, N. (2020). Surveying pornography use: A shaky science resting on poor measurement foundations. *The Journal of Sex Research*, *57*(6), 722–742.

Koós, M., Nagy, L., Kraus, S. W., Demetrovics, Z., Potenza, M. N., Gaudet, É., Ballester-Arnal, R., Batthyány, D., Bergeron, S., Billieux, J., Briken, P., Burkauskas, J., Cárdenas-López, G., Carvalho, J., Castro-Calvo, J., Chang, Y.-H., Chen, L., Ciocca, G., Corazza, O., … Bőthe, B. (2025). Why Do People Watch Pornography? Cross-Cultural Validation of the Pornography Use Motivations Scale (PUMS) and Its Short Form (PUMS-8). *Journal of Sex Research*, *62*(6), 1049–1065.

Kor, A., Zilcha-Mano, S., Fogel, Y. A., Mikulincer, M., Reid, R. C., & Potenza, M. N. (2014). Psychometric development of the problematic pornography use scale. *Addictive Behaviors*, *39*(5), 861–868.

Kraus, S. W., Krueger, R. B., Briken, P., First, M. B., Stein, D. J., Kaplan, M. S., Voon, V., Abdo, C. H., Grant, J. E., & Atalla, E. (2018). Compulsive sexual behaviour disorder in the ICD-11. *World Psychiatry*, *17*(1), 109.

Kühn, S., & Gallinat, J. (2014). Brain structure and functional connectivity associated with pornography consumption: The brain on porn. *JAMA Psychiatry*, *71*(7), 827–834.

Kvalem, I. L., Træen, B., & Iantaffi, A. (2016). Internet pornography use, body ideals, and sexual self-esteem in Norwegian gay and bisexual men. *Journal of Homosexuality*, *63*(4), 522–540.

Leickly, E., Nelson, K., & Simoni, J. (2017). Sexually explicit online media, body satisfaction, and partner expectations among men who have sex with men: A qualitative study. *Sexuality Research and Social Policy*, *14*, 270–274.

Leonhardt, N. D., Willoughby, B. J., & Young-Petersen, B. (2018). Damaged Goods: Perception of Pornography Addiction as a Mediator Between Religiosity and Relationship Anxiety Surrounding Pornography Use. *The Journal of Sex Research*, *55*(3), 357–368.

Lewczuk, K., Wójcik, A., & Gola, M. (2019). Increase in the prevalence of online pornography use: Objective data analysis from the period between 2004 and 2016 in Poland. *Archives of Sexual Behavior*, 1–15.

Ley, D., Prause, N., & Finn, P. (2014). The emperor has no clothes: A review of the 'pornography addiction'model. *Current Sexual Health Reports*, *6*, 94–105.

Litsou, K., Byron, P., McKee, A., & Ingham, R. (2021). Learning from pornography: Results of a mixed methods systematic review. *Sex Education*, *21*(2), 236–252.

Lockhart, W. B., & Wagman, F. H. (1970). *The report of the commission on obscenity and pornography*. US Government Printing Office.

Longino, H. E. (2018). Pornography, oppression, and freedom: A closer look. In *Living With Contradictions* (pp. 154–161). Routledge. https://www.taylorfrancis.com/chapters/edit/10.4324/9780429499142-20/pornography-oppression-freedom-closer-look-helen-longino

López-Pinar, C., Esparza-Reig, J., & Bőthe, B. (2025). Psychotherapy for problematic pornography use: A comprehensive meta-analysis. *Journal of Behavioral Addictions*.

Maddock, M. E., Steele, K., Esplin, C. R., Hatch, S. G., & Braithwaite, S. R. (2019). What is the relationship among religiosity, self-perceived problematic pornography use, and depression over time? *Sexual Addiction & Compulsivity*, *26*(3–4), 211–238.

Major, B., Testa, M., & ByIsms, W. H. (2024). Responses to upward and downward social comparisons: The impact of esteem-relevance and perceived control. In *Social comparison* (pp. 237–260). Routledge.

Malki, K., Rahm, C., Öberg, K. G., & Ueda, P. (2021). Frequency of pornography use and sexual health outcomes in Sweden: Analysis of a national probability survey. *The Journal of Sexual Medicine*, *18*(10), 1735–1751.

Mattebo, M. (2014). *Use of pornography and its associations with sexual experiences, lifestyles and health among adolescents*.

McKee, A., Albury, K., & Lumby, C. (2008). *The porn report*. Melbourne University Publishing.

Mestre-Bach, G., & Potenza, M. N. (2023). Loneliness, Pornography Use, Problematic Pornography Use, and Compulsive Sexual Behavior. *Current Addiction Reports*, *10*(4), 664–676.

Mestre-Bach, G., Potenza, M. N., Granero, R., Urízsar, J. C., Tarragón, E., Chiclana Actis, C., Testa, G., Fernández-Aranda, F., & Jiménez-Murcia, S. (2024). Understanding the co-occurrence of gambling disorder and problematic pornography use: Exploring sociodemographic and clinical factors. *Journal of Gambling Studies*, *40*(3), 1295–1314.

Miller, D. J., Raggatt, P. T. F., & McBain, K. (2020). A Literature Review of Studies into the Prevalence and Frequency of Men's Pornography Use. *American Journal of Sexuality Education*, *15*(4), 502–529.

Monro, F. J., & Huon, G. F. (2006). Media-portrayed idealized images, self-objectification, and eating behavior. *Eating Behaviors*, *7*(4), 375–383.

Morgan, J. F., Reid, F., & Lacey, J. H. (1999). The SCOFF questionnaire: Assessment of a new screening tool for eating disorders. *Bmj*, *319*(7223), 1467–1468.

Morrison, T. G., Morrison, M. A., & Bradley, B. A. (2007). Correlates of gay men's self-reported exposure to pornography. *International Journal of Sexual Health*, *19*(2), 33–43.

Niazof, D., Weizman, A., & Weinstein, A. (2019). The contribution of ADHD and attachment difficulties to online pornography use among students. *Comprehensive Psychiatry*, *93*, 56–60.

Orth, U., Meier, L. L., Bühler, J. L., Dapp, L. C., Krauss, S., Messerli, D., & Robins, R. W. (2024). Effect size guidelines for cross-lagged effects. *Psychological Methods*, *29*(2), 421.

Paslakis, G., Chiclana Actis, C., & Mestre-Bach, G. (2022). Associations between pornography exposure, body image and sexual body image: A systematic review. *Journal of Health Psychology*, *27*(3), 743–760.

Perry, S. L. (2016). From Bad to Worse? Pornography Consumption, Spousal Religiosity, Gender, and Marital Quality. *Sociological Forum*, *31*(2), 441–464.

Perry, S. L., & Snawder, K. J. (2017). Pornography, Religion, and Parent–Child Relationship Quality. *Archives of Sexual Behavior*, *46*(6), 1747–1761.

Peter, J., & Valkenburg, P. M. (2014). Does exposure to sexually explicit Internet material increase body dissatisfaction? A longitudinal study. *Computers in Human Behavior*, *36*, 297–307.

Prause, N. (2019). Porn is for masturbation. *Archives of Sexual Behavior*, *48*(8), 2271–2277.

Probst, M., Vandereycken, W., Coppenolle, H. V., & Vanderlinden, J. (1995). The Body Attitude Test for patients with an eating disorder: Psychometric characteristics of a new questionnaire. *Eating Disorders*, *3*(2), 133–144.

Quittkat, H. L., Hartmann, A. S., Düsing, R., Buhlmann, U., & Vocks, S. (2019). Body dissatisfaction, importance of appearance, and body appreciation in men and women over the lifespan. *Frontiers in Psychiatry*, *10*, 864.

Rasmussen, K. & Alex Bierman. (2016). How does religious attendance shape trajectories of pornography use across adolescence? *Journal of Adolescence*, *49*, 191–203.

Regnerus, M., Gordon, D., & Price, J. (2016). Documenting Pornography Use in America: A Comparative Analysis of Methodological Approaches. *The Journal of Sex Research*, *53*(7), 873–881.

Reid, R. C., & Kafka, M. P. (2014). Controversies about hypersexual disorder and the DSM-5. *Current Sexual Health Reports*, *6*, 259–264.

Reid, R. C., Li, D. S., Gilliland, R., Stein, J. A., & Fong, T. (2011). Reliability, validity, and psychometric development of the pornography consumption inventory in a sample of hypersexual men. *Journal of Sex & Marital Therapy*, *37*(5), 359–385.

Rissel, C., Richters, J., De Visser, R. O., McKee, A., Yeung, A., & Caruana, T. (2017). A profile of pornography users in Australia: Findings from the second Australian study of health and relationships. *The Journal of Sex Research*, *54*(2), 227–240.

Rodin, J., Silberstein, L., & Striegel-Moore, R. (1984). *Women and weight: A normative discontent.* Nebraska symposium on motivation.

Rothman, E. F. (2021). *Pornography and public health*. Oxford University Press.

Sassover, E., Abrahamovitch, Z., Amsel, Y., Halle, D., Mishan, Y., Efrati, Y., & Weinstein, A. (2023). A study on the relationship between shame, guilt, self-

criticism and compulsive sexual behaviour disorder. *Current Psychology*, *42*(10), 8347–8355.

Schaefer, L. M., & Thompson, J. K. (2018). Self-objectification and disordered eating: A meta-analysis. *International Journal of Eating Disorders*, *51*(6), 483–502.

Schmidt, G., Sigusch, V., & Schäfer, S. (1973). Responses to reading erotic stories: Male-female differences. *Archives of Sexual Behavior*, *2*, 181–199.

Sevic, S., Ciprić, A., Buško, V., & Štulhofer, A. (2020). The relationship between the use of social networking sites and sexually explicit material, the internalization of appearance ideals and body self-surveillance: Results from a longitudinal study of male adolescents. *Journal of Youth and Adolescence*, *49*(2), 383–398.

Sharp, G., & Oates, J. (2019). Sociocultural influences on men's penis size perceptions and decisions to undergo penile augmentation: A qualitative study. *Aesthetic Surgery Journal*, *39*(11), 1253–1259.

Sharp, G., Tiggemann, M., & Mattiske, J. (2016). Factors that influence the decision to undergo labiaplasty: Media, relationships, and psychological well-being. *Aesthetic Surgery Journal*, *36*(4), 469–478.

Short, M. B., Kasper, T. E., & Wetterneck, C. T. (2015). The Relationship Between Religiosity and Internet Pornography Use. *Journal of Religion and Health*, *54*(2), 571–583.

Singareddy, C., Shrestha, S., Zheng, A., Harlow, B. L., Barrington-Trimis, J. L., & Harlow, A. F. (2025). Prospective association of symptoms of depression and anxiety with pornography viewing frequency among young adults. *Archives of Sexual Behavior*, *54*(2), 749–759.

Stormezand, G. N., Doorduin, J., Chaves, L. T., García, D. V., Nienhuis, F. J., Schoevers, R. A., Kremer, B. P., Booij, J., & Dierckx, R. A. (2021). No evidence for decreased D2/3 receptor availability and frontal hypoperfusion in subjects with compulsive pornography use. *Psychiatry Research: Neuroimaging*, *311*, 111284.

Striegel-Moore, R. H., Rosselli, F., Perrin, N., DeBar, L., Wilson, G. T., May, A., & Kraemer, H. C. (2009). Gender difference in the prevalence of eating disorder symptoms. *International Journal of Eating Disorders*, *42*(5), 471–474.

Štulhofer, A., Wiessner, C., Koletić, G., Pietras, L., & Briken, P. (2022). Religiosity, perceived effects of pornography use on personal sex life, and moral

incongruence: Insights from the German Health and Sexuality Survey (GeSiD). *The Journal of Sex Research*, *59*(6), 720–730.

Swami, V. (2015). Cultural influences on body size ideals. *European Psychologist*.

Swami, V., Robinson, C., & Furnham, A. (2021a). Associations between body image, social physique anxiety, and dating anxiety in heterosexual emerging adults. *Body Image*, *39*, 305–312.

Thompson, J. K., Coovert, M. D., & Stormer, S. M. (1999). Body image, social comparison, and eating disturbance: A covariance structure modeling investigation. *International Journal of Eating Disorders*, *26*(1), 43–51.

Thompson, J. K., Van Den Berg, P., Roehrig, M., Guarda, A. S., & Heinberg, L. J. (2004). The sociocultural attitudes towards appearance scale-3 (SATAQ-3): Development and validation. *International Journal of Eating Disorders*, *35*(3), 293–304.

Tiggemann, M., & Miller, J. (2010). The Internet and adolescent girls' weight satisfaction and drive for thinness. *Sex Roles*, *63*(1), 79–90.

Tisserand, A., Philippi, N., Botzung, A., & Blanc, F. (2023). *Me, Myself and My Insula: An Oasis in the Forefront of Self-Consciousness. Biology, 12 (4), 599*.

Tylka, T. L. (2011). *Positive psychology perspectives on body image.*

van den Brink, F., Vollmann, M., Sternheim, L. C., Berkhout, L. J., Zomerdijk, R. A., & Woertman, L. (2018). Negative body attitudes and sexual dissatisfaction in men: The mediating role of body self-consciousness during physical intimacy. *Archives of Sexual Behavior*, *47*, 693–701.

Vieira, C., & Griffiths, M. D. (2024). Problematic Pornography Use and Mental Health: A Systematic Review. *Sexual Health & Compulsivity*, 1–41.

Vigna-Taglianti, F., Brambilla, R., Priotto, B., Angelino, R., Cuomo, G., & Diecidue, R. (2017). Problematic internet use among high school students: Prevalence, associated factors and gender differences. *Psychiatry Research*, *257*, 163–171.

Vogels, E. A. (2018a). Loving oneself: The associations among sexually explicit media, body image, and perceived realism. *The Journal of Sex Research*.

Vogels, E. A. (2018b). Loving oneself: The associations among sexually explicit media, body image, and perceived realism. *The Journal of Sex Research*.

Wang, H., Alivi, M. A. B., & Mustafa, S. E. B. (2025). Unveiling the relationship between social media and self-objectification: A three-level meta-analysis. *Body Image*, *53*, 101895.

Wéry, A., Canale, N., Bell, C., Duvivier, B., & Billieux, J. (2020). Problematic online sexual activities in men: The role of self-esteem, loneliness, and social anxiety. *Human Behavior and Emerging Technologies*, *2*(3), 217–226.

White, R. T., & Arzi, H. J. (2005). Longitudinal studies: Designs, validity, practicality, and value. *Research in Science Education*, *35*, 137–149.

Whitfield, T. H., Rendina, H. J., Grov, C., & Parsons, J. T. (2018). Viewing sexually explicit media and its association with mental health among gay and bisexual men across the US. *Archives of Sexual Behavior*, *47*(4), 1163–1172.

Wills, T. A. (1981). Downward comparison principles in social psychology. *Psychological Bulletin*, *90*(2), 245.

Wilson, W. C. (1971). Facts versus fears: Why should we worry about pornography? *The ANNALS of the American Academy of Political and Social Science*, *397*(1), 105–117.

Wright, P. J. (2013). US males and pornography, 1973–2010: Consumption, predictors, correlates. *Journal of Sex Research*, *50*(1), 60–71.

Wright, P. J., Herbenick, D., & Paul, B. (2022). Casual condomless sex, range of pornography exposure, and perceived pornography realism. *Communication Research*, *49*(4), 547–566.

Yoder, V. C., Virden, T. B., & Amin, K. (2005). Internet Pornography and Loneliness: An Association? *Sexual Addiction & Compulsivity*, *12*(1), 19–44.

III/Table 1.

Sociodemographic Characteristics of Participants

Characteristics	*N*	%	*M*	*SD*
Total sample	2801	100		
Gender				
Men	1336	47.70		
Women	1465	52.30		
Marital status				
Single	1450	51.7		
Married	1282	45.7		

Widow	5	0.17		
Divorced	38	1.51		
Not identified	26	0.92		
Age				
18-21	1700	60.69	28	4.75
22-27	973	34.7		
28-34	128	4.56		
Education level				
Elementary	669	23.38		
High school	1659	59		
University degree / MA /	449	16		
MSC /	16	0.57		
Post-graduate degree				
Not identified	20	0.71		
Socio economic status				
Among the best	18	0.64		
Much better than average	53	1.89		
Slightly better than average	329	11.74		
Average	1817	64.86		
Slightly worse than average	447	15.95		
Much worse than average	116	0.57		
Does not know	7	0.24		
Not identified	14	0.49		

Note. M = mean, *SD* = standard deviation, *N* = sample size, %= percentage.

III/Table 2.

Reliability Indices, Comparisons of Men's and Women's Problematic Pornography Use, And Body Dissatisfaction

	ω	α	Mean (SD) Overall	*N*	Mann-Whitney U Z test Statistic	(1) Men *M* (SD)	(2) Women *M* (SD)	*t*	Cohen's d	*p*
1. Problematic pornography use T1[a]	.93	.93	1.09 (2.42)	2801 (Men: 1,336, Women: 1,465)	-7.93	1.14 (0.54)	1.04 (0.32)	5.21	0.20	< 0.01
2. Problematic pornography use T2[a]	.94	.94	1.07 (1.14)	2801 (Men: 1,336- Women: 1,465)	-8.20	1.09 (0.45)	1.05 (0.42)	2.42	0.08	< 0.01
3. Body dissatisfaction T1 [b]	.92	.92	3.53 (4.37)	2729 (Men: 1,298, Women: 1,431)		3.07 (4.15)	3.94 (4.53)	-5.19	0.20	< 0.01
4. Body dissatisfaction T2 [b]	.95	.95	3.98 (5.27)	2484 (Men: 1,174 Women: 1,130)		5.26 (4.66)	4.66 (5.34)	2.73	0.11	< 0.01

Note. a = 1 = Never, 2 = Rarely, 3 = Occasionally, 4 = Sometimes, 5 Often, 6 = Very often, 7 = All the time ; b = 0 = never, 1 = rarely, 2 = sometimes, 3 = often, 4 = usually, 5 = always; M = mean; SD = standard deviation; ω = omega; α = Cronbach's alpha

III/Table 3.

Descriptive Statistics, Correlation Between Problematic Pornography Use And Body Dissatisfaction

Variables	Skew. (SE)	Kurt. (SE)	Range	1	2	3	4
1. Problematic pornography use T1 [a]	8.01 (.03)	72.93 (.19)	0-7	1			
2. Problematic pornography use T2 [a]	9.33 (.03)	100 (.07)	0-7	.36**	1		
3. Body dissatisfaction T1 [b]	1.25 (.04)	1.03 (.09)	0-6	.16**	.17**	1	
4. Body dissatisfaction T2 [b]	.84 (.04)	-.43 (.09)	0–6	.16**	.17**	.39**	1

Note. Skew. = Skewness; Kurt. = Kurtosis; a = 1 = Never, 2 = Rarely, 3 = Occasionally, 4 = Sometimes, 5 = Often, 6 = Very often, 7 = All the time ; b = 0 = never, 1 = rarely, 2 = sometimes, 3 = often, 4 = usually, 5 = always; M = mean; SD = standard deviation.

** $p < .001$; * $p < .005$

III/Table 4.

Examination of The Problematic Pornography Use and Body Dissatisfaction Among Men and Women

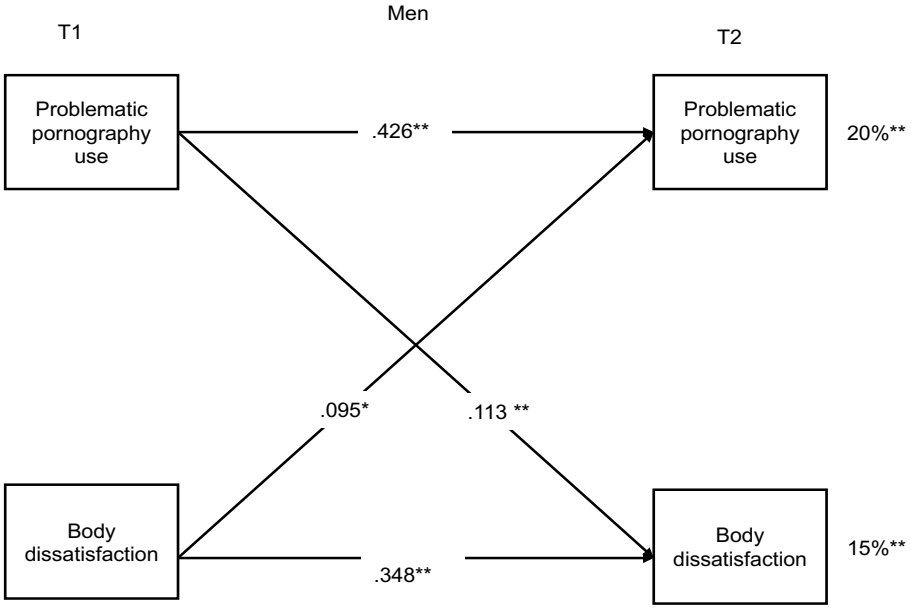
Models	**χ^2 (df)**	**CFI**	**TLI**	**RMSEA**	**RMSEA (90% CI)**
Model A: Latent model baseline analysis (total sample)	506.435 (164) **	.959	.952	.023	.021 - .025
Model B: Same as model A with grouping by gender	991.667 (360) **	.925	.920	.035	.033 - .038
Model C: Same as model B, parameters constrained to be equal between groups	1036.917 (369) **	.920	.918	.036	.033 - .039

Note. χ2 =scaled chi square; df=degrees of freedom; CFI=Comparative Fit Index; TLI=Tucker-Lewis Index; RMSEA=Root Mean Square Error of Approximation; 95 % CI=95 % confidence interval for Root Mean Square Error of Approximation; SRMR=Standardized Root Mean Square Residual.

** p <.001; * p <.005

III/Figure 1.

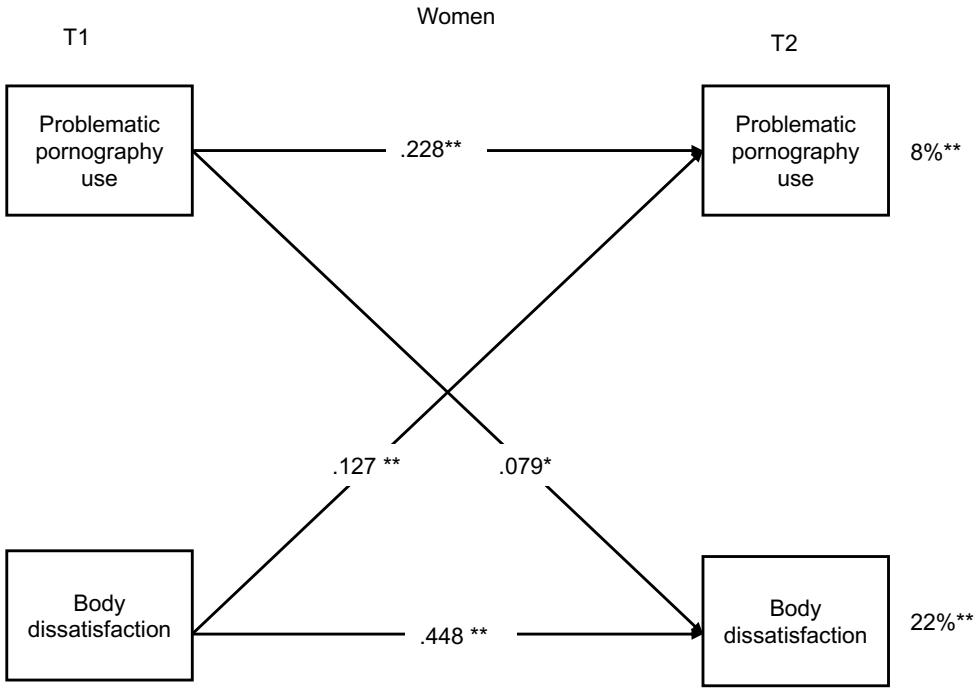
Relationship Between Problematic Pornography Use and Body Dissatisfaction Among Men



Note. Correlations between the variables are not presented to ensure clarity. Only significant associations between T1 problematic pornography use and body dissatisfaction, and T2 problematic pornography use and body dissatisfaction, are presented for the sake of clarity. Coefficients are standardized regression coefficients. Explained variances of the outcomes are presented on the right side of each variable. T1 represents the first data collection wave and T2 represents the second data collection wave, **p* <0.05, ***p* < 0.01.

III/Figure 2.

Relationship Between Problematic Pornography Use and Body Dissatisfaction Among Women



Note. Correlations between the variables are not presented to ensure clarity. Only significant associations between T1 problematic pornography use and body dissatisfaction, and T2 problematic pornography use and body dissatisfaction, are presented for the sake of clarity. Coefficients are standardized regression coefficients. Explained variances of the outcomes are presented on the right side of each variable. T1 represents the first data collection wave and T2 represents the second data collection wave, *p <0.05, **p < 0.01.

IV. A Longitudinal Examination of the Mediating Role of Body Dissatisfaction in the Relationship Between Pornography Use Frequency and Eating Disturbances: A Cross-Lagged Mediation Model

(Study 3)

Abstract

Albeit a positive association between pornography use frequency (PUF) and body dissatisfaction has been identified, studies examining the link between PUF and disordered eating behavior (DEB) have been highly limited in scope (e.g., only focused on men) and have several limitations (e.g., lack of a longitudinal study design and small sample size). The present study aimed to address one of these gaps by examining the longitudinal associations between PUF and DEB, while considering the mediating role of body dissatisfaction over a one-year period in a sample of young adults. We performed an autoregressive cross-lagged analysis with a multi-group approach among 3764 adults (M_{age}= 23.00, SD_{age}=4.74, 48.24% men and 51.75% women). Our findings showed that higher levels of PUF were cross-sectionally associated with higher levels of DEB among men and women at T1. However, at T2, higher levels of PUF were associated with lower levels of DEB among men and women. Longitudinally, baseline PUF was positively associated with DEB among men and women. However, the reverse association was not observed. Furthermore, the results indicated that body dissatisfaction partially mediated the associations of PUF at baseline (T1) with DEB at the one-year follow-up (T2) both for men (b_{indirect} = .047, 95% CI [.012, .078], p =.011) and women (b_{indirect} = .033, 95% CI [.001, .059], p =.044). Body dissatisfaction seems to play a significant mediating role in the relationship between PUF and DEB. Clinicians treating clients with DEB may consider PUF as a potential contributing factor to the development of eating disturbances via body dissatisfaction.

Keywords: Pornography, Body dissatisfaction, Eating disturbances, Adults, Longitudinal design

IV/1. Introduction

Technological developments have contributed to pornography use (60-98% report lifetime pornography use) and eating disorders in Western countries (8.4%) (Ballester-Arnal et al., 2023; Galmiche et al., 2019; Ramos-Galarza et al., 2023). In the context of pornography, its increased prevalence can be attributed to its easy access, availability, and affordability, resulting from technological advancements (Cooper, 1998; Rowland & Uribe, 2020). Nonetheless, along with the technological developments the prevalence of eating disorders has also increased due to idealized bodies presented on online platforms (Šmahel et al., 2018). Pornography is one of the platforms that depicts extreme bodies and can lead to physical and emotional changes (Kohut et al., 2020) as well as body dissatisfaction (Paslakis et al., 2022). As pornography typically portrays idealized and exaggerated bodies (Rothman, 2021), some findings suggest an association between pornography use frequency (PUF) and disordered eating behavior (DEB) via body dissatisfaction (Griffiths et al., 2018, Duggan & McCreary, 2013; Gewirtz-Meydan & Spivak-Lavi, 2023).

Previous research has emphasized the potential impact of sociocultural factors on body image concerns and eating disorder symptoms through mechanisms such as social comparison and the internalization of social norms (Bonfanti et al., 2025). The tripartite influence model can be used to explain how various factors can contribute to body dissatisfaction and DEB (Thompson et al., 1999). According to this model, peers, family, and media may all contribute to body dissatisfaction and DEB by encouraging the internalization of societal appearance ideals and engagement in social comparison. In the present study, this model provides a framework for understanding the link between PUF and DEB among men and women as it highlights how pornography may relate to individuals' body image and perceptions of how others evaluate their appearance, which in turn may result in DEB (Rodgers & Chabrol, 2009; Thompson et al., 2004).

Moreover, although the tripartite influence model accounts for the association between prior PUF and later DEB, a reverse association is also possible. Baseline DEB may relate to later levels of PUF. Previous studies have found that excessive pornography use is positively associated with escapism and stress reduction (Bőthe, Tóth-Király, Bella, et al., 2021b). Given that DEB, particularly overeating and food restriction, are linked to negative affect (Eck & Byrd-Bredbenner, 2021), it is possible

that DEB may result in negative emotions, which in turn may drive individuals to engage in greater pornography use to cope with negative emotions associated with their DEB.

All the studies on pornography use and DEBs reviewed so far include several limitations (e.g., focusing on men only, using a small sample, and relying on cross-sectional study designs). Therefore, the current study aimed to examine both cross-sectional and longitudinal associations between PUF and DEB in a sample of young Hungarian adults, examining the mediating role of body dissatisfaction while considering potential gender differences.

IV/1.1. Pornography use

Pornography lacks a single, unified definition. Some studies have characterized pornography as any written or visual material depicting explicit nudity in the absence of any sexual activity (Wright & Randall, 2012). While some scholars incorporated sexual acts into the definition (Peter & Valkenburg, 2011). However, a comprehensive study suggests that pornography may not always involve sexual acts but may be limited to nudity alone eliciting immediate sexual and emotional reactions. It may also lead to cognitive, emotional, and behavioral alterations (Kohut et al., 2020).

Pornography use is highly prevalent among both men and women. Recent studies conducted on nationally representative samples from Australia (Rissel et al., 2017a), Norway (Træen et al., 2004), Poland (Lewczuk et al., 2022), and the United States (Herbenick et al., 2020) aged between 18 and 60, suggested that 70% to 94 % of individuals have engaged in pornography use at some point in their lives. The prevalence of pornography consumption among men exceeds that among women across their entire lifespan. According to a recent study, the frequency of pornography use varied between 46% to 97% among adult men and between 16-38% among adult women (Rissel et al., 2017). Nonetheless, women tend to engage in pornography use more often than men when it is intended to create mutual sexual pleasure through mutual participation (Solano et al., 2020). Additionally, while men tend to use only pornographic videos, women may prefer both visual and written pornography (Solano et al., 2020). Men and women also differ in their preferences for pornographic contexts. Women tend to seek more interactive forms, such as erotic chatting or sexting (Maheux et al., 2021a; Mills, 1998), whereas men tend to seek more individual activities, such as pornography watching (Solano et al., 2020).

In addition to being a safe environment for learning about sexuality, a considerable amount of literature has been published on the potential negative consequences of PUF (Singareddy et al., 2025). These studies have emphasized both sexual and mental health-related negative consequences such as diminished interest in sexual activity with one's partner (Poulsen et al., 2013; Stewart & Szymanski, 2012; Sun et al., 2016), low self-esteem (Kvalem et al., 2016), anxiety (Borgogna, Duncan, et al., 2018), depression (Diengdoh & Ali, 2022) as well as marital (Perry & Whitehead, 2019), and occupational problems (Kumar et al., 2021).

IV/1.2. Disordered eating behavior

DEBs are eating behaviors that do not fall within the diagnostic criteria for eating disorders. This term includes a variety of behaviors that deviate from typical eating patterns, but do not meet the strict criteria for a formal eating disorder diagnosis (Pennesi & Wade, 2016). These dysfunctional eating patterns include excessive dieting, fasting, vomiting and emotional eating without the presence of binge eating episodes (Croll et al., 2002). Although DEB can differ from clinically diagnosed eating disorders, it may lead to more severe eating-related problems, resulting in clinically diagnosed eating disorders (Bryla, 2003; Hilbert et al., 2014; Killen et al., 1996).

Persistent DEB, if not properly managed, can progressively transform into diagnosable eating disorders. Among these eating disorders the most well-known forms are bulimia nervosa and binge eating. Bulimia Nervosa is characterized by recurrent episodes of binge eating, accompanied by persistent inappropriate compensatory behaviors (e.g., self-induced vomiting and use of laxatives). On the other hand, binge eating is characterized by recurrent episodes of eating large amounts of food within a short period of time (e.g., within any 2-hour period) in the absence of any notable efforts towards weight control behavior (Fairburn & Cooper, 2011). In addition to these well-known eating disorders, over the last two decades, with the development of technology, food addiction and orthorexia nervosa have gained significant attention as emerging DEB, although they have not been included in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) (APA, 2013). Regarding food addiction, although there is no agreed upon definition, it refers to specific behaviors related to food that involves excessive and uncontrolled consumption of high-calorie foods despite negative consequences (Imperatori et al., 2016; Schulte et al., 2017). Therefore, individuals with food addiction are more likely to consume processed food that are rich

in sugar, salt, and fat (Schulte et al., 2019). Additionally, refined carbohydrates trigger a similar increase in extracellular dopamine levels in the brain therefore it shares some similar neurological features with other addictive substances like nicotine or alcohol (De Luca, 2014; Di Chiara & Imperato, 1988; Gearhardt et al., 2023). Based on a recent systematic review, it has been reported that the overall estimated pooled prevalence of food addiction among adults is approximately 14% (Praxedes et al., 2022). In contrast, orthorexia nervosa is characterized by the pathological fixation on healthy eating (Dunn & Bratman, 2016) individuals with orthorexia nervosa devote excessive time to selecting, preparing, and consuming healthy food, resulting in significant impairment in one's social and interpersonal life (Lopes et al., 2020; Moroze et al., 2015).

The onset of eating disorders typically occurs during adolescence and young adulthood (Halmi, 2005). The National Comorbidity Survey Replication (NCS-R) states that the onset of different types of eating disorders can vary between 18 and 21 years of age. Additionally, a study on clinical samples of various eating disorders (i.e., Anorexia Nervosa and Bulimia Nervosa) found evidence consistent with NCS-R findings, indicating that the typical age of eating disorder onset is around 18 years old (Volpe et al., 2016). The prevalence rates of eating disorders differ based on the type of eating disorders and gender, with a higher rate observed among women. For instance, the prevalence of bulimia nervosa in women is 3%, whereas that in men is only 1% (van Eeden et al., 2021). Similarly, the prevalence of binge eating is 13% in women and 5%in men (Mustelin et al., 2017). Moreover, the prevalence of food addiction is 6% in women and 3% in men (Pedram et al., 2013). In summary, eating disorders exhibit significant gender disparities and frequently co-occur with body-related issues, resulting in substantial impairment of an individual's life.

Beyond sociocultural influences, the etiology of DEB is recognized as multifactorial, including biological, psychological, and developmental components (Collier & Treasure, 2004). Biologically, prior research has underscored the role of serotonin, a neurotransmitter critically involved in appetite regulation and emotional regulation (Compan et al., 2012). Psychologically, personality traits, such as perfectionism, neuroticism, and obsessive-compulsive tendencies have been positively associated with DEB (Cassin & von Ranson, 2005). From a developmental perspective, early life experiences, particularly childhood sexual abuse have been identified as

significant risk factors that may contribute to the onset of DEB in later life (Fischer et al., 2010) .

IV/1.3. Associations between pornography use and disordered eating behavior

Besides biological, psychological, and developmental factors contributing to the DEB a core issue in eating disorders is predominantly centered on physical concern, such as body surveillance (Martin-Wagar & Weigold, 2023) and body dissatisfaction (Fairburn, 2003). Moreover, as mentioned above sociocultural factors, particularly mass media, may have a significant impact on body image concerns. Traditional media, including magazines and TV, often promote unrealistic body ideals, such as extremely thin and toned figures, resulting in preoccupation with weight loss (Groesz et al., 2002). Similar to other forms of media, pornography also portrays idealized bodies, using actors whose body features are not representative of the general population in terms of height, muscularity, and size of genitalia (Leickly et al., 2017). As a result, the urge to conform to societal 'standards' for 'beauty' gained through either mass media or pornography may result in DEB by changing the eating habits of the individual or through body dissatisfaction (Harriger et al., 2022; Marks et al., 2020). Therefore, scholars have suggested that pornography use may skew an individual's perceived body image (Borgogna, Lathan, et al., 2018; Demirgül et al., 2025, Duggan & McCreary, 2013; Leickly et al., 2017; Peter & Valkenburg, 2014; Whitfield et al., 2018,). For example, pornography use may lead to greater body monitoring tendencies (Doornwaard et al., 2014), internalization of body ideals (Sevic et al., 2020), and a desire for muscularity (Morrison et al., 2007; Tylka & Kroon Van Diest, 2015).

According to research, specific circumstances can heighten the likelihood of DEB (Striegel-Moore, Silberstein, & Rodin, 1986) through body dissatisfaction (Karchynskaya et al., 2022, Mazzeo & Bulik, 2009). Objectification Theory posits that prolonged exposure to sexual objectification may result in women internalizing such messages and starting to look at their bodies from an external observer and perceive their own bodies as objects to be examined by other individuals (Fredrickson & Roberts, 1997).Those who hold this perspective are found to be more likely to monitor their bodies resulting in body dissatisfaction (Maheux et al., 2021b; Tiggemann & Lynch, 2001). Previous studies have shown that men can also experience self-objectification, albeit to a lesser degree than women with desire for a more muscular body (Daniel et al., 2014; Michaels et al., 2013). This is because men's bodies are

objectified as well, although not to the same extent as women's. Body dissatisfaction which results from self-objectification may also contribute to DEB. A previous meta-analytic study has shown that self-objectified women and men experience DEB with women reporting greater DEB than men (Schaefer & Thompson, 2018). Therefore, pornography can also result in self-objectification and DEB due to experiencing body dissatisfaction. Significant gender differences can also be observed as women report greater body checking and DEB than men (Striegel-Moore et al., 2009) in relation to their PUF.

In addition to self-objectification being a significant risk factor for DEB (Tolosa-Sola et al., 2019), they also exhibit a close association with sexual dysfunction along with DEB (Tolosa-Sola et al., 2019). Given that body-related problems may also be associated with pornography consumption and sexual dysfunction (Woertman & Van Den Brink, 2012), some studies examining body-related problems associated with frequent pornography use have included DEB (Duggan & McCreary, 2013a; Griffiths et al., 2018b; O'Brien et al., 2015; Tylka & Calogero, 2019). However, because body dissatisfaction frequently precipitates DEB (Lladó & González-Soltero, 2017; Tylka, 2004), body dissatisfaction needs to be considered (Duggan & McCreary, 2013a; Griffiths et al., 2018b). However, among previous studies examining pornography use and DEB, only one study considered the potential role of body dissatisfaction, but that study focused on problematic pornography use (i.e., uncontrolled pornography use resulting in significant distress and functional impairment) rather than PUF in general (Gewirtz et al., 2023).

Recent studies have observed a link between PUF and DEB; however, findings are not yet fully generalizable, as only a limited body of evidence has been gathered. A recent study using cross-sectional data from Israeli gay and heterosexual men found a positive association between problematic pornography use and DEB (Gewirtz et al., 2023). Similarly, another study examined the association between PUF and DEB in Australian sexual minority men and showed a weak positive association between PUF and DEB (Griffiths et al., 2018b). Zhou's (2019) study examining contributing factors to DEB by relying on social media communication revealed a positive association between pornography use and DEB. Although some studies have established a positive link between PUF and DEB in men (Gewirtz-Meydan & Spivak-Lavi, 2023a; Griffiths

et al., 2018b), a study comparing gay and heterosexual men's PUF and DEB observed non-significant associations (Duggan & McCreary, 2013a).

Overall, associations between pornography use and DEB is not clear as previous studies yielded inconsistent findings. Moreover, the existing literature on PUF and DEB is not without limitations. For example, all studies used cross-sectional designs, limiting the ability to determine the directionality between PUF and DEB. Additionally, prior studies have primarily focused on men (Gewirtz et al., 2023), with a small sample size and a predominance of sexual minority men (Duggan & McCreary, 2013a; Griffiths et al., 2018b). Moreover, a recent study included only Israeli men, where obligatory military service can have an effect on individuals' views on masculinity, which may result in more DEB (Bartlett & Mitchell, 2015; Gewirtz-Meydan & Spivak-Lavi, 2023a; Hudson et al., 2007). In addition, the inclusion of self-selected participants (Duggan & McCreary, 2013a) and the absence of large samples (Duggan & McCreary, 2013a; Gewirtz-Meydan & Spivak-Lavi, 2023a; Griffiths et al., 2018b; O'Brien et al., 2015) may introduce bias and limit the generalizability of previous findings. Moreover, body dissatisfaction is one of the most important risk factors of DEB and previous studies established a link between pornography use and body dissatisfaction (Paslakis et al., 2022). Yet, the potential mediating role of body dissatisfaction between PUF and DEB has not been examined yet. Due to these limitations, the current body of research is insufficient to draw conclusions about the association between PUF and DEB, especially among women, who are at a higher risk of developing DEB than men (Hudson et al., 2007).

IV/1.4. The present study

We aimed to examine the cross-sectional and longitudinal associations between PUF and DEB in a sample of young Hungarian adults, while examining the mediating effect of body dissatisfaction. Moreover, this study aimed to explore potential differences between men and women on PUF and DEB, given that prior studies did not include women, limiting our understanding (Duggan & McCreary, 2013b; Gewirtz-Meydan & Spivak-Lavi, 2023b; Griffiths et al., 2018a). Our first hypothesis was that PUF would be positively associated with DEB cross-sectionally and longitudinally as well. Our second hypothesis was that women would report higher level of DEB symptoms than men in relation with their PUF. Our third hypothesis was that body dissatisfaction would mediate the association between T1 PUF and T2 DEB.

IV/2. Methods

IV/2.1. Participants and Procedure

We used data from the Budapest Longitudinal Study (BLS). The BLS is a longitudinal study that examines the factors associated with various addictions and problematic behaviors, such as gaming disorder, gambling disorder, compulsive sexual behavior, and other substance addictions (e.g., alcohol and exercise) among young adults aged 18-34 in Budapest, Hungary. The data for the first and second waves were acquired between March and July 2019 and June and September 2020, respectively. In both waves, we gathered sociodemographic information along with PUF and DEB. The final sample included 3910 participants. In our study, we included 3764 participants, as they were the only individuals who could be matched across both data collection waves (the remaining participants could not be matched because of issues such as non-matching identification numbers). A stratified random sampling technique was implemented to differentiate participants by age group and neighborhood. Informed consent was obtained prior to data collection. However, due to the confidential nature of the information and the fact that participants were not informed about the potential for their data to be shared publicly, we chose not to upload the dataset to OSF.

A total of 3764 participants completed the survey (Mage = 23 years, SD = 4.74). Regarding gender, 1815 (52%) were men and 1949 (48%) were women. Regarding marital status, 2103 (56%) reported being single, 1504 (40%) were married, 10 were widows (0.26%), and 86 (2%) were divorced. The descriptive statistics are presented in Table 4.1.

IV/2.3. Measures

IV/2.3.1. Sociodemographic information

Demographic information, including gender, age, highest level of education, and marital status, was collected and is presented in Table 4.1.

IV/2.3.2. Frequency of pornography use

Participants indicated the past-year PUF with the question, “During the last year, how often did you watch pornographic videos/films?” on a 10-point scale (0 = “not once in the last year," 10 = "more than seven times a week”).

IV/2.3.3. Body dissatisfaction

Body dissatisfaction was assessed using the subscale of the Body Attitude Test (BAT; Probst et al., 1995). This subscale comprises four items rated on a five-point Likert scale ranging from 1 (*never)* to 5 (*always).* An example item is "When I look at myself in the mirror, I am dissatisfied with my own body." In the present study, the internal consistency (Cronbach's alpha) of this subscale was α = .84 for T1, and α = .92 for T2. Higher scores on the scale indicate higher body dissatisfaction. The Hungarian version of the scale is presented in Appendix 4.1.

IV/2.3.4. Disordered eating behavior

Eating disturbances were assessed using the SCOFF questionnaire (Morgan et al., 1999). This instrument consists of five items that use a two-point scale, with respondents indicating either 'yes' or 'no' for each item. A score of ≥2 suggests a strong likelihood of anorexia nervosa or bulimia, with one point awarded for each affirmative response. An example item is, "Would you say food dominates your life?". In the present study, the internal consistency (Cronbach's alpha) of this scale was α = .74 for T1, and α = .71 for T2. Higher scores on the scale indicate higher levels of potential DEB. The Hungarian version of the scale is presented in Appendix 4.2.

IV/2.4. Data Analysis

We used SPSS 26 to calculate the descriptive statistics, Cronbach's alpha, and McDonald's omega. Although Cronbach's alpha is often used as a measure of reliability, it is not considered to be the optimal choice (A. F. Hayes & Coutts, 2020). In this study, we evaluated the reliability using two methods: McDonald's omega and Cronbach's alpha. Table 2 presents the results. The final, weighted sample comprised 3,733 individuals. Regarding the DEB scale at Time 1, our sample consisted of 3,733 participants, whereas at Time 2, the number of individuals dropped to 2,667, reflecting a 30% attrition rate between the two time points. With regard to the PUF, 3,472 and 2,620 individuals completed the questionnaire at Time 1 and Time 2, respectively, indicating a 24% attrition rate between the two time points. To address the issue of missing data, we employed the Full Information Maximum Likelihood method, as recommended by Enders and Bandalos (2001) and Newman (2014).

The primary analysis was conducted using MPlus 8.7, which employed the Robust Maximum Likelihood Estimator (MLR) to examine auto-regressive cross-lagged models and explore the relationship between PUF and DEB. While analyzing the

data, we standardized all the measures and tested the mediation model to determine whether the direct and indirect effects were significant by employing the bootstrap method with 10,000 replicate samples along with the calculation of 95% confidence intervals. To test the adequacy of the model fit, we used commonly used goodness of fit indices (Brown, 2015), including the Comparative Fit Index (CFI; ≥0.90 for acceptable; ≥0.95 for excellent), Root-Mean-Square Error of Approximation (RMSEA; ≤0.06 for good, ≤0.08 for acceptable), and Tucker Lewis Index (TLI; ≥0.95 for good, ≥0.90 for acceptable (Brown, 2015). We employed the Full Information Maximum Likelihood method to address missing data (Enders & Bandalos, 2001; Newman, 2014).

We conducted two cross-lagged panel models. Our first model estimated the associations between PUF and DEB and our second model estimated the mediating role of body dissatisfaction between PUF and DEB. Both models tested for potential gender differences. In our first model, we examined the associations between PUF and DEB (Model A) and subsequently, we introduced the gender grouping variable (i.e., men vs. women) into the model and used a multigroup analysis to measure potential differences across genders (i.e., men vs. women) (Model B). Afterward, all associations between PUF and DEB were constrained across gender groups (Model C). Lastly, we examined the differences between Model B and C (i.e., unconstrained and constrained models) to determine whether gender differences were significant, by examining changes in chi-square, CFI, TLI, and RMSEA values. A significant corrected chi-square difference test, significant decreases in CFI and TLI ($\Delta CFI \leq 0.010$; $\Delta TLI \leq 0.010$), and significant increases in RMSEA ($\Delta RMSEA \leq 0.015$) (Bőthe et al., 2021c; Chen, 2007; Cheung & Rensvold, 2002) indicated whether the constrained and unconstrained models differed significantly (i.e., whether the associations differed significantly between men and women).

For the mediational model, we examined the indirect effects of PUF on DEB via body dissatisfaction. The mediated effect (ab) of PUF at T1 on DEB at T2 via body dissatisfaction at T2 was defined as the product of Path a (the effect of PUF at T1 on body dissatisfaction at T2) and Path b (the effect of body dissatisfaction at T2 on DEB at T2). Similarly, the mediated effect (cd) of PUF at T1 on DEB at T2 through body dissatisfaction was defined as the product of Path c (the effect of PUF at T1 on Body dissatisfaction). We only examined the mediated effect of body dissatisfaction for one path which is from T1 PUF to T2 DEB (Model D). We then introduced the gender

grouping variable (i.e., men vs. women) into the model and used a multigroup analysis to measure potential differences across genders (i.e., men vs. women) in the relationship between PUF and DEB (Model E). Then, all associations between PUF and DEBs were constrained across gender groups (Model F). Finally, we examined the differences between Model E and F (i.e., unconstrained and constrained models) to determine whether gender differences were significant, by examining changes in chi-square, CFI, TLI, and RMSEA values. All the model fit indices are presented in Table 4.4.

IV/3. Results

IV/3.1. Descriptive statistics of pornography use, body dissatisfaction, and disordered eating behavior and comparisons of men and women

We conducted an independent-samples t-test to investigate gender-based differences in PUF, DEB, and body dissatisfaction. We observed significant gender differences in PUF, DEB, and body dissatisfaction. According to our findings, men exhibited significantly higher levels of T1 and T2 PUF (T1, M = 2.45, SD = 2.59, T2, M = 1.80, SD = 2.81) than women (T1, M = 0.98, SD = 2.03; T2, M = 0.70, SD = 1.80). Conversely, women exhibited significantly higher levels of T1 and T2 body dissatisfaction (T1, M = 1.27, SD = 1.21, T2, M = 0.98, SD = 1.13) than men (T1, M = 0.80, SD = 0.94, T2, M = 0.77, SD =1.04). Concerning DEB, similarly women exhibited significantly higher levels of T1 and T2 DEB (T1, M = 0.08, SD = 0.18, T2, M = 0.08, SD = 0.20) than men (T1, M = 0.05, SD = 0.15, T2, M = 0.07, SD = 0.22) see Table 4.2.

The correlations among the study variables are presented in Table 3. Pearson correlation coefficients showed that associations between PUF and DEB were significant at T1 but not at T2. Additionally, body dissatisfaction was positively associated with PUF at T1 and T2 (rs ranging between .09 to.11, p <.001). Moreover, body dissatisfaction was positively associated with DEB at T1 and T2 (rs ranging between .12 to.55, p <.001).

IV/3.2. Cross-sectional and longitudinal associations between pornography use and disordered eating behavior without the mediating variable

Model A showed an excellent fit to the data (see Table 4 for details). To examine whether association between PUF and DEB differed across genders (i.e., men and women), we compared the Model B to the Model C (ΔCFI = 0.172; ΔTLI = 0.286;

ΔRMSEA = -0.048). Moreover, the corrected chi-square difference test result was significant ($\Delta\chi^2 = 32.085$; $p < .001$), suggesting significant gender differences.

Among men, higher levels of T1 DEB were associated with higher levels of T1 PUF *(r* = .13, 95% CI [.08, .19], $p < .001$). Higher levels of T2 DEB were associated with lower levels of T2 PUF *(r* = -.08, 95% CI [-.12, -.03], $p = .001$). Longitudinally, higher levels of T1 PUF were associated with higher levels of T2 PUF ($\beta = .13$, 95% CI [.06, .22], $p = .001$) and higher levels of T1 DEB were associated with higher levels of T2 DEB ($\beta = .13$, 95% CI [.06, .20], $p < .001$). T1 DEB was not significantly associated with T2 PUF ($\beta = .05$, 95% CI [-.05, .09], $p = .104$). Higher levels of T1 PUF were associated with higher levels of T2 DEB ($\beta = .15$, 95% CI [.09, .24], $p < .001$). All significant associations between DEB and PUF had weak effect sizes.

Among women, higher levels of T1 DEB were associated with higher levels of T1 PUF *(r* = .20, 95% CI [.15, .26], $p < .001$). Higher levels of T2 DEB were associated with higher levels of T2 PUF *(r* = .06, 95% CI [.01, .12], $p = .029$). Longitudinally, T1 PUF was not significantly associated with T2 PUF ($\beta = -.03$, 95% CI [-.06, .07], $p = .133$). T1 DEB was not significantly associated with T2 PUF ($\beta = .06$, 95% CI [-.02, .15], $p = .184$). Higher levels of T1 PUF were associated with higher levels of T2 DEB ($\beta = .21$, 95% CI [.06, .24], $p = .001$). Higher levels of T1 DEB were associated with higher levels of T2 DEB ($\beta = .11$, 95% CI [.03, .17], $p = .005$). All significant associations between DEB and PUF had weak effect sizes. Although our longitudinal analysis provided evidence of directionality, it is important to emphasize that we cannot draw conclusions regarding causal relationships between the study variables.

IV/3.3. The mediating role of body dissatisfaction in the associations of pornography use and disordered eating behavior

To examine the mediating role of body dissatisfaction (T2) in the relationship between PUF and DEB differed across genders (i.e., men and women), we compared the Model F to the Model E (ΔCFI = 0.691; ΔTLI = 0.691; ΔRMSEA = -0.124). The corrected chi-square difference test result was significant ($\Delta\chi^2 = 125.438$; $p < .001$). These results indicated that when body dissatisfaction was included as a mediating variable, the model differed significantly between men and women. Therefore, the results of Model E are reported in the following section.

Among men, higher levels of T1 DEB were associated with higher levels of T1 PUF *(r* = .13, 95% CI [.08, .19], $p < .001$). Higher levels of T1 DEB were associated

with higher levels of T1 body dissatisfaction *(r* = .40, 95% CI [.34, .45], $p < .001$). Higher levels of T1 PUF were associated with higher levels of T1 body dissatisfaction *(r* = .21, 95% CI [.15, .26], $p < .001$). Higher levels of T2 DEB were associated with lower levels of T2 PUF *(r* = -.12, 95% CI [-.17, -.07], $p < .001$). Longitudinally, higher levels of T1 PUF were associated with higher levels of T2 PUF (β = .12, 95% CI [.06, .18], $p < .001$). T1 DEB was not significantly associated with T2 DEB (β = .03, 95% CI [-.02, .08], p = .261). T1 DEB was not significantly associated with T2 PUF (β = .23, 95% CI [-.64, 1.47], p = .510). Higher levels of T1 PUF were associated with higher levels of T2 DEB (β = .10, 95% CI= [<.001, .014], p<.001). Higher levels of T1 PUF were associated with higher levels of T2 body dissatisfaction (β = .08, 95% CI = [<.001, .06], p = .009). Higher levels of T1 ED were associated with higher levels of T2 body dissatisfaction (β = .18, 95% CI [.71, .81], $p < .001$). Higher levels of T1 body dissatisfaction were associated with higher levels of T2 body dissatisfaction (β =.08, 95% CI= [.01,.14], p =.013). All significant associations between DEB and PUF had weak effect sizes.

Among women, higher levels of T1 DEB were associated with higher levels of T1 PUF *(r* = .20, 95% CI [.14, .26], $p < .001$). Higher levels of T1 DEB were associated with higher levels of T1 body dissatisfaction *(r* = .55, 95% CI [.51, .58], $p < .001$). Higher levels of T1 PUF were associated with higher levels of T1 body dissatisfaction *(r* = .18, 95% CI [.13, .23], p<.001). Higher levels of T2 DEB were associated with higher levels of T2 PUF *(r* = -.06, 95% CI [-.11, .004], p = .029). Longitudinally, T1 PUF was not significantly associated with T2 PUF (β = - .03, 95% CI [-.07, .01], p = .133). T1 DEB was not significantly associated with T2 PUF (β = .06, 95% CI [-.02, .15], p = .184). Higher levels of T1 PUF were associated with higher levels of T2 DEB (β = .18, 95%CI= [.12, .24], p<.001). T1 DEB was not significantly associated with T2 DEB (β = .026, 95% CI [-.03, .09], p = .411). T1 body dissatisfaction was not significantly associated with T2 PUF (β = .01, 95% CI [-.05, .07], p = .714). T1 body dissatisfaction was not significantly associated with T2 DEB (β = -.03, 95% CI [-.09, .03], p = .270). Higher levels of T1 PUF were associated with higher levels of T2 body dissatisfaction (β = .06, 95% CI [<.001, .12], p = .047). Higher levels of T1 DEB were associated with higher levels of T2 body dissatisfaction (β = .15, 95%CI [.08, .22], p<.001). Higher levels of T1 body dissatisfaction were associated with higher levels of T2 body dissatisfaction (β =.17, 95% CI [.11,.23], p<.001). All significant associations

between DEB and PUF had weak effect sizes. Although our longitudinal analysis provided evidence of directionality, it is important to emphasize that we cannot draw conclusions regarding causal relationships between the study variables.

According to Model E's findings, body dissatisfaction mediated the associations between T1 PUF and T2 BED among both men ($b_{indirect}$ = .047, 95% CI [.012, .078], p =.011) and women ($b_{indirect}$ = .033, 95% CI [.001, .050], p =.044). Thus, PUF predicted increases in body dissatisfaction which, in turn, predicted increases in DEB overtime among men and women as well. This indirect association was small and stronger indirect effects emerged via the autoregressive effects of PUF and DEB. Thus, body dissatisfaction partially mediated the relationship between T1 PUF and T2 DEB. The cross-lagged results, incorporating body dissatisfaction as a mediator, are presented in Figure. 4.1 and Figure. 4.2, and the indirect effects are presented in Table 4.5.

IV/4. Discussion

Previous studies examining the association between PUF and DEB include several limitations (e.g., use of cross-sectional study designs, focus on only men participants; Duggan & McCreary, 2013a; Gewirtz-Meydan & Spivak-Lavi, 2023a; Griffiths et al., 2018b), leaving significant knowledge gaps in the literature. This study aimed to fill these existing gaps by investigating the cross-sectional and longitudinal associations between PUF and DEB among a young adult sample, considering potential gender-based differences. The present study also contributes to the literature by considering the body dissatisfaction as a mediating variable in the associations between PUF and DEB overtime.

The present findings suggest that men scored higher on PUF than did women. However, women scored higher on body dissatisfaction and DEB than men. The observed greater level in PUF could be attributed to men having higher solitary sexual drive (Dosch et al., 2016; Frankenbach et al., 2022; Oliver & Hyde, 1993) or men adopting more emotion-focused coping mechanism than women due to having difficulty in expressing their emotions (Lotfi-Hajilo et al., 2017; Tamres et al., 2002). The reason for the greater DEB and body dissatisfaction in women may drive from the tendency of women to attribute a greater significance to their physical appearance (Hudson et al., 2007; Öberg & Tornstam, 1999; Quittkat et al., 2019). These results are consistent with previous studies showing that men generally have greater levels of PUF (Dawson et al., 2020; Grubbs et al., 2019; Rissel et al., 2017a), whereas women usually show greater

levels of DEB and body dissatisfaction than men (Frederick & Essayli, 2016; Hudson et al., 2007; Quittkat et al., 2019).

Concerning the cross-sectional associations between the study variables, among men and women, T1 PUF and T1 DEB were positively associated with each other. These findings were consistent with previous studies reporting the positive association between PUF and DEB (Duggan & McCreary, 2013b; Gewirtz et al., 2023; Griffiths et al., 2018a). However, T2 PUF and T2 DEB were negatively associated with each other. The negative correlation between PUF and DEB at T2 is noteworthy, particularly considering the positive significant association observed between T1 PUF and T2 DEB in the cross-lagged analysis. These differences may be attributed to the characteristics of cross-lagged models, which control for correlations within time-points and stability, across time. Therefore, if DEB remained stable, a simple correlation coefficient at T2 may not capture the true longitudinal association, as baseline levels (T1) would account for a significant portion of the variance later (T2) (Kearney, 2017).

Regarding longitudinal results, the present findings were mostly supportive of the first hypothesis as higher levels of baseline PUF were associated with higher DEB one year later with significant gender differences, but not the other way around, although these associations were weak. This finding suggests that PUF may be considered a risk factor for the development of DEB. This association was stronger for women than men. This finding is novel as previous studies did not include female samples. Yet, this finding is also consistent with The Self-Objectification Theory (Fredrickson & Roberts, 1997), which suggests that DEB may be more prevalent among women than men, as women's bodies are more frequently objectified in society. Women may also be more sensitive to societal influences such as media and peer influences resulting in greater DEB symptoms (Thompson et al., 2004, Eisenberg et al., 2011). Moreover, significant positive association between PUF and DEB is in accordance with previous studies, which showed that greater engagement in pornography use may be linked to greater DEB (Duggan & McCreary, 2013b; Gewirtz et al., 2023; Griffiths et al., 2018a). However, when comparing the present results to those of previous studies, it is crucial to consider their limitations, such as their sole focus on men. It is important to note that this is the first longitudinal study examining the associations between PUF and DEB, shedding light on the directionality of the associations between PUF and DEB among men and women as well.

PUF not only directly predicted DEB one year later, but also indirectly predicted it through body dissatisfaction, supporting the third hypothesis. The findings of the present study corroborate The Tripartite Influence Model (Thompson et al., 2004) and Social Comparison Theory (Festinger, 1954), which highlight that individuals might be influenced by sociocultural factors including peers, media, and family members, and as a result, individuals may tend to evaluate themselves against them when there is no objective reference for the evaluation. There are two main types of comparison: upward (comparing oneself to better off) and downward (comparing oneself to worse off). Given that pornography includes idealized bodies, it is more likely for the individual to engage in upward comparison, and as a result, one may develop body dissatisfaction, which, in turn, may result in eating problems (Gewirtz-Meydan & Spivak-Lavi, 2023b). The gender differences in the associations between PUF and DEB may be attributed to various factors. For instance, women tend to be more sensitive to appearance ideals (Bornioli et al., 2021), and this sensitivity may be exacerbated by the prevalence of thin bodies in pornography. Such exposure can reinforce unrealistic body ideals, increase body dissatisfaction, and ultimately contribute to greater engagement in DEB among women.

Taken together, the present study has significant implications for both research and practical applications. In terms of research, it is necessary to conduct further studies focusing on the underlying mechanisms resulting in DEB, including diverse samples (e.g., not only men). Qualitative studies, such as the grid elaboration method (GEM), can be conducted to gain a deeper understanding of the association between PUF and DEB (Joffe & Elsey, 2014). With regard to practical applications, findings suggest that mental health professionals should consider incorporating strategies for addressing pornography use along with existing interventions for eating-related problems. Additionally, mental health professionals may develop treatment plans that include therapeutic techniques aimed at improving eating-related disorders, while also addressing pornography consumption and body dissatisfaction as they might be intertwined.

IV/4.1. Study limitations and future directions

The present study has several strengths, one of which is the examination of the mediating effect of body dissatisfaction over time using large samples of both men and women. This addresses a gap in the literature, as previous studies have primarily been

cross-sectional and have focused mainly on heterosexual and sexual minority men (Duggan & McCreary, 2013; Gewirtz et al.,2023; Griffiths et al., 2018b). However, this study is not without limitations. First, despite the longitudinal nature of the study, causal associations between the study variables cannot be established. Second, although previous studies have shown a link between PUF and DEB in sexual minority individuals, sexual orientation was not assessed in the present study (Duggan & McCreary, 2013; Gewirtz et al., 2023; Griffiths et al., 2018b). Third, the data collection for T2, but not T1, was conducted during the COVID-19 pandemic, and we observed a decline in PUF from T1 to T2. However, previous longitudinal studies have shown that changes in pornography use among adults (Grubbs et al., 2022) and adolescents (Bőthe et al., 2022) were only temporary, suggesting that these changes should not significantly impact our findings. Fourth, we did not provide a definition for pornography, potentially introducing some biases. Fifth, DEB scores were highly skewed, potentially due to the population's characteristics (e.g., the sample was drawn from the general population, where eating disturbances have a relatively low prevalence rate) (Túry et al., 2021; Tury et al., 1994). Sixth, the percentage of explained variance was small varying between 3 to 7%. In this study, we used the SCOFF scale, although it demonstrates some degree of validity for screening eating disorders in the general population, its application as a diagnostic tool is uncertain. Nevertheless, it is recognized that SCOFF questionnaire captures eating disturbances rather than eating disorders. Seventh, our results were based on self-reported data, which may introduce some biases (i.e., recall bias or under- or over-reporting; Štulhofer et al., 2021). Finally, given that loneliness can influence both PUF and DEB, it would have been ideal to control for its potential effects through marital status. However, marital status varied between T1 and T2, and a substantial amount of missing data at T2 could not be adequately addressed using FIML. Therefore, we did not include marital status as a control variable. Future studies investigating the associations between pornography use and DEB should control for marital status, include sexual and gender minority individuals, and consider them in the statistical analyses. Additionally, future research may explore which specific types of DEBs (e.g., binge eating, anorexia, bulimia) are associated with PUF.

IV/5. Conclusion

Although previous studies have observed positive links between PUF and DEB, they had several limitations (e.g., lack of longitudinal findings, no data on women) that

hindered the conclusions that could be drawn from their findings. To address these limitations, we investigated cross-sectional and longitudinal associations between PUF and DEB in a sample of adult men and women. The findings suggest that higher levels of PUF were associated with higher levels of DEB over time, with body dissatisfaction partially mediating this association among both men and women, although the observed effect sizes were weak. Based on these findings, clinicians treating clients with DEB may consider inquiring about their clients' pornography use and body dissatisfaction as a potential factor contributing to the development and maintenance of DEB.

Declarations

Conflict of Interest

None.

Informed Consent

All participants in the study provided the consent to participate in the research.

Data availability

The data analysis for the present work are available at the following OSF link (LINK).

Ethical Approval

The study protocol for the BLS research was approved by the Research and Ethical Committee of the Medical Research Council, with the approval number 60471–2/2018/EKU. The analysis codes were uploaded in Open Science Framework (OSF; LINK).

Funding

Funding: SAD's contribution was supported by the Hungarian National Research, Development, and Innovation Office (KKP126835, FK134807, K138976). BB was supported by the FRQSC – Research Support for New Academics (NP) Program.

IV/6. References

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition). American Psychiatric Publishing.

Ballester-Arnal, R., García-Barba, M., Castro-Calvo, J., Giménez-García, C., & Gil-Llario, M. D. (2023). Pornography consumption in people of different age groups: An analysis based on gender, contents, and consequences. *Sexuality Research and Social Policy*.

Bartlett, B. A., & Mitchell, K. S. (2015). Eating disorders in military and veteran men and women: A systematic review. *International Journal of Eating Disorders*, *48*(8), 1057–1069.

Bessesen, D. H., Bull, S., & Cornier, M. A. (2008). Trafficking of dietary fat and resistance to obesity. *Physiology & Behavior*, *94*(5), 681–688.

Black, P., & Hendy, H. M. (2019). Perceived powerlessness as a mediator between life stressors and deviant behaviors. *Deviant Behavior*, *40*(9), 1080–1089.

Bonfanti, R. C., Melchiori, F., Teti, A., Albano, G., Raffard, S., Rodgers, R., & Coco, G. L. (2025). The association between social comparison in social media, body image concerns and eating disorder symptoms: A systematic review and meta-analysis. *Body Image*, *52*, 101841.

Borgogna, N. C., Duncan, J., & McDermott, R. C. (2018). Is scrupulosity behind the relationship between problematic pornography viewing and depression, anxiety, and stress? *Sexual Addiction & Compulsivity*, *25*(4), 293–318.

Borgogna, N. C., Lathan, E. C., & Mitchell, A. (2018). Is women's problematic pornography viewing related to body image or relationship satisfaction? *Sexual Addiction & Compulsivity*, *25*(4), 345–366.

Bornioli, A., Lewis-Smith, H., Slater, A., & Bray, I. (2021). Body dissatisfaction predicts the onset of depression among adolescent females and males: A prospective study. *J Epidemiol Community Health*, *75*(4), 343–348.

Bőthe, B., Tóth-Király, I., Bella, N., Potenza, M. N., Demetrovics, Z., & Orosz, G. (2021). Why do people watch pornography? The motivational basis of pornography use. *Psychology of Addictive Behaviors*, *35*(2), 172.

Bőthe, B., Vaillancourt-Morel, M.-P., Dion, J., Paquette, M.-M., Massé-Pfister, M., Tóth-Király, I., & Bergeron, S. (2022). A longitudinal study of adolescents' pornography use frequency, motivations, and problematic use before and during the COVID-19 pandemic. *Archives of Sexual Behavior*, *51*(1), 139–156.

Branley-Bell, D., Talbot, C. V., Downs, J., Figueras, C., Green, J., McGilley, B., & Murphy-Morgan, C. (2023). It's not all about control: Challenging mainstream framing of eating disorders. *Journal of Eating Disorders*, *11*(1), 1–8

Brown, T. A. (2015). *Confirmatory factor analysis for applied research*. Guilford publications.

Bryla, K. Y. (2003). Disordered eating among female adolescents: Prevalence, risk factors, and consequences. *Health Educator*, *35*(2), 25–29.

Cardoso, J., Ramos, C., Brito, J., & Almeida, T. C. (2022). Predictors of pornography use: Difficulties in emotion regulation and loneliness. *Journal of Sexual Medicine*, *19*(4), 620–628.

Cassin, S. E., & von Ranson, K. M. (2005). Personality and eating disorders: A decade in review. *Clinical Psychology Review*, *25*(7), 895–916.

Collier, D. A., & Treasure, J. L. (2004). Etiology of eating disorders. *British Journal of Psychiatry*, *185*(5), 363–365.

Coomber, K., & King, R. M. (2012). Coping strategies and social support as predictors and mediators of eating disorder carer burden and psychological distress. *Social Psychiatry and Psychiatric Epidemiology*, *47*, 789–796.

Cooper, A. (1998). Sexuality and the Internet: Surfing into the new millennium. *CyberPsychology & Behavior*, *1*(2), 187–193.

Cooper, A., Delmonico, D. L., Griffin-Shelley, E., & Mathy, R. M. (2004). Online sexual activity: An examination of potentially problematic behaviors. *Sexual Addiction & Compulsivity*, *11*(3), 129–143.

Cooper, A., Golden, G. H., & Kent-Ferraro, J. (2002). Online Sexual Behaviors in the Workplace: How can Human Resource Departments and Employee Assistance Programs Respond Effectively? *Sexual Addiction & Compulsivity*, *9*(2–3), 149–165.

Croll, J., Neumark-Sztainer, D., Story, M., & Ireland, M. (2002). Prevalence and risk and protective factors related to disordered eating behaviors among adolescents: Relationship to gender and ethnicity. *Journal of Adolescent Health*, *31*(2), 166–175. =

Curtis, G. R., Coudriet, J. M., Sanzalone, L., Mack, N. R., Stein, L. M., Hayes, M. R., & Barson, J. R. (2019). Short-and long-access palatable food self-administration results in different phenotypes of binge-type eating. *Physiology & Behavior*, *212*, 112700.

Dakanalis, A., Zanetti, A. M., Riva, G., Colmegna, F., Volpato, C., Madeddu, F., & Clerici, M. (2015). Male body dissatisfaction and eating disorder symptomatology: Moderating variables among men. *Journal of Health Psychology*, *20*(1), 80–90.

Daniel, S., Bridges, S. K., & Martens, M. P. (2014). The development and validation of the Male Assessment of Self-Objectification (MASO). Psychology of Men & Masculinity, 15(1), 78-89.

Danielsen, H. E., Finserås, T. R., Andersen, A. I. O., Hjetland, G. J., Woodfin, V., & Skogen, J. C. (2023). *Mirror, mirror on my screen: Focus on self-presentation on social media is associated with perfectionism and eating disturbance among adolescents.*

Daspe, M.-È., Vaillancourt-Morel, M.-P., Lussier, Y., Sabourin, S., & Ferron, A. (2018). When pornography use feels out of control: The moderation effect of relationship and sexual satisfaction. *Journal of Sex & Marital Therapy*, *44*(4), 343–353.

Dawson, K., Nic Gabhainn, S., & MacNeela, P. (2020). Toward a model of porn literacy: Core concepts, rationales, and approaches. *Journal of Sex Research*, *57*(1), 1–15.

De Luca, M. A. (2014). Habituation of the responsiveness of mesolimbic and mesocortical dopamine transmission to taste stimuli. *Frontiers in Integrative Neuroscience*, *8*, 21.

Demirgul,SA, & RİGÓ, A. (2023). Orthorexia Nervosa as a Disorder of Less Intuition and Emotion Dysregulation. *Psikiyatride Güncel Yaklaşımlar*, *15*(Supplement 1), 346–354.

Demirgül, S. A., Demetrovics, Z., Czakó, A., Paksi, B., Kökönyei, G., & Bőthe, B. (2025). Bidirectional positive associations between problematic pornography use and body dissatisfaction in women and men: Findings among Hungarian young adults in a one-year longitudinal study. *Body Image*, *54*, 101940.

Di Chiara, G., & Imperato, A. (1988). Drugs abused by humans preferentially increase synaptic dopamine concentrations in the mesolimbic system of freely moving rats. *Proceedings of the National Academy of Sciences*, *85*(14), 5274–5278.

Diengdoh, I., & Ali, A. (2022). Body image and its association with depression, anxiety, and self-esteem among college going students: A study from Northeast India. *Indian Journal of Community Medicine*, *47*(2), 218–222.

Dingemans, A., Danner, U., & Parks, M. (2017). Emotion regulation in binge eating disorder: A review. *Nutrients*, *9*(11), 1274.

Doornwaard, S. M., Bickham, D. S., Rich, M., Vanwesenbeeck, I., van den Eijnden, R. J., & Ter Bogt, T. F. (2014). Sex-related online behaviors and adolescents' body and sexual self-perceptions. *Pediatrics*, *134*(6), 1103–1110.

Dosch, A., Belayachi, S., & Van der Linden, M. (2016). Implicit and explicit sexual attitudes: How are they related to sexual desire and sexual satisfaction in men and women? *Journal of Sex Research*, *53*(2), 251–264.

Duggan, S. J., & McCreary, D. R. (2013a). Body image, eating disorders, and the drive for muscularity in gay and heterosexual men: The influence of media images. Journal of Homosexuality (pp. 45–58). Routledge.

Dunn, T. M., & Bratman, S. (2016). On orthorexia nervosa: A review of the literature and proposed diagnostic criteria. *Eating Behaviors*, *21*, 11–17.

Eisenberg, D., Nicklett, E. J., Roeder, K., & Kirz, N. E. (2011). Eating disorder symptoms among college students: Prevalence, persistence, correlates, and treatment-seeking. *Journal of American College Health*, *59*(8), 700–707.

Enders, C. K., & Bandalos, D. L. (2001). The relative performance of full information maximum likelihood estimation for missing data in structural equation models. *Structural Equation Modeling*, *8*(3), 430–457.

Fairburn, C. G., & Cooper, Z. (2011). Eating disorders, DSM–5, and clinical reality. *British Journal of Psychiatry*, *198*(1), 8–10.

Fischer, S., Stojek, M., & Hartzell, E. (2010). Effects of multiple forms of childhood abuse and adult sexual assault on current eating disorder symptoms. *Eating Behaviors*, *11*(3), 190–192

Frankenbach J, Weber M, Loschelder DD, Kilger H, Friese M. Sex drive: Theoretical conceptualization and meta-analytic review of gender differences. Psychol Bull. 2022 Sep-Oct;148(9-10):621-661

Frederick, D. A., & Essayli, J. H. (2016). Male body image: The roles of sexual orientation and body mass index across five national US studies. Psychology of Men & Masculinity, 17(4), 336- 351.

Fredrickson, B. L., & Roberts, T.-A. (1997). Objectification Theory: Toward Understanding Women's Lived Experiences and Mental Health Risks. *Psychology of Women Quarterly*, *21*(2), 173–206.

Galmiche, M., Déchelotte, P., Lambert, G., & Tavolacci, M. P. (2019). Prevalence of eating disorders over the 2000–2018 period: A systematic literature review. *American Journal of Clinical Nutrition*, *109*(5), 1402–1413.

García-Grau, E., Fusté, A., Miró, A., Saldana, C., & Bados, A. (2004). Coping style and vulnerability to eating disorders in adolescent boys. *European Eating Disorders Review: The Professional Journal of the Eating Disorders Association*, *12*(1), 61–67.

Gearhardt, A. N., Bueno, N. B., DiFeliceantonio, A. G., Roberto, C. A., Jiménez-Murcia, S., & Fernandez-Aranda, F. (2023). Social, clinical, and policy implications of ultra-processed food addiction. *Bmj*, *383*. https://www.bmj.com/content/383/BMJ-2023-075354.full.

Gearhardt, A. N., Corbin, W. R., & Brownell, K. D. (2009). Food addiction: An examination of the diagnostic criteria for dependence. *Journal of Addiction Medicine*, *3*(1), 1–7.

Gewirtz-Meydan, A., & Spivak-Lavi, Z. (2023a). The association between problematic pornography use and eating disorder symptoms among heterosexual and sexual minority men. *Body Image*, *45*, 284–295.

Girouard, A., Dion, J., Bőthe, B., O'Sullivan, L., & Bergeron, S. (2021). Bullying victimization and sexual wellbeing in sexually active heterosexual, cisgender and sexual/gender minority adolescents: The mediating role of emotion regulation. *Journal of Youth and Adolescence*, *50*(11), 2136–2150.

Gordon, E. L., Ariel-Donges, A. H., Bauman, V., & Merlo, L. J. (2018). What is the evidence for "food addiction?" A systematic review. *Nutrients*, *10*(4), 477.

Griffiths, S., Mitchison, D., Murray, S. B., & Mond, J. M. (2018a). Pornography use in sexual minority males: Associations with body dissatisfaction, eating disorder symptoms, thoughts about using anabolic steroids and quality of life. *Australian & New Zealand Journal of Psychiatry*, *52*(4), 339–348.

Groesz, L. M., Levine, M. P., & Murnen, S. K. (2002). The effect of experimental presentation of thin media images on body satisfaction: A meta-analytic review. *International Journal of Eating Disorders*, *31*(1), 1–16.

Grubbs, J. B., Kraus, S. W., & Perry, S. L. (2019). Self-reported addiction to pornography in a nationally representative sample: The roles of use habits,

religiousness, and moral incongruence. *Journal of Behavioral Addictions*, 8, 88-93

Grubbs, J. B., Perry, S. L., Grant Weinandy, J. T., & Kraus, S. W. (2021). Porndemic? A longitudinal study of pornography use before and during the COVID-19 pandemic in a nationally representative sample of Americans. *Archives of Sexual Behavior*, 51, 123-137

Halmi KA. The multimodal treatment of eating disorders. *World Psychiatry*. 2005 Jun;4(2):69-73. PMID: 16633511; PMCID: PMC1414734

Harriger, J. A., Evans, J. A., Thompson, J. K., & Tylka, T. L. (2022). The dangers of the rabbit hole: Reflections on social media as a portal into a distorted world of DEBited bodies and eating disorder risk and the role of algorithms. *Body Image*, *41*, 292–297.

Hayaki, J. (2009). Negative reinforcement eating expectancies, emotion dysregulation, and symptoms of bulimia nervosa. *International Journal of Eating Disorders*, *42*(6), 552–556.

Hayes, A. F., & Coutts, J. J. (2020). Use omega rather than Cronbach's alpha for estimating reliability. But…. *Communication Methods and Measures*, *14*(1), 1–24.

Herbenick, D., Fu, T.-C., Wright, P., Paul, B., Gradus, R., Bauer, J., & Jones, R. (2020). Diverse sexual behaviors and pornography use: Findings from a nationally representative probability survey of Americans aged 18 to 60 years. *Journal of Sexual Medicine*, *17*(4), 623–633.

Hilbert, A., Pike, K. M., Goldschmidt, A. B., Wilfley, D. E., Fairburn, C. G., Dohm, F.-A., Walsh, B. T., & Weissman, R. S. (2014). Risk factors across the eating disorders. *Psychiatry Research*, *220*(1–2), 500–506.

Hudson, J. I., Hiripi, E., Pope Jr, H. G., & Kessler, R. C. (2007). The prevalence and correlates of eating disorders in the National Comorbidity Survey Replication. *Biological Psychiatry*, *61*(3), 348–358.

Imperatori, C., Fabbricatore, M., Vumbaca, V., Innamorati, M., Contardi, A., & Farina, B. (2016). Food addiction: Definition, measurement and prevalence in healthy subjects and in patients with eating disorders. *Rivista Di Psichiatria*, *51*(2), 60–65.

Joffe, H., & Elsey, J. W. (2014). Free association in psychology and the grid elaboration method. *Review of General Psychology*, *18*(3), 173–185.

Karchynskaya, V., Kopcakova, J., Madarasova Geckova, A., Klein, D., de Winter, A. F., & Reijneveld, S. A. (2022). Body image, body composition and environment: Do they affect adolescents' physical activity? *European Journal of Public Health*, *32*(3), 341–346.

Kearney, M. W. (2017). Cross lagged panel analysis. *The SAGE Encyclopedia of Communication Research Methods*, *1*, 313–314.

Killen, J. D., Taylor, C. B., Hayward, C., Haydel, K. F., Wilson, D. M., Hammer, L., Kraemer, H., Blair-Greiner, A., & Strachowski, D. (1996). Weight concerns influence the development of eating disorders: A 4-year prospective study. *Journal of Consulting and Clinical Psychology, 64*(5), 936–940 h

Kohut, T., Balzarini, R. N., Fisher, W. A., Grubbs, J. B., Campbell, L., & Prause, N. (2020). Surveying pornography use: A shaky science resting on poor measurement foundations. *Journal of Sex Research*, *57*(6), 722–742.

Kumar, P., Patel, V. K., Bhatt, R. B., Vasavada, D. A., Sangma, R. D., & Tiwari, D. S. (2021). Prevalence of problematic pornography use and attitude toward pornography among the undergraduate medical students. *Journal of Psychosexual Health*, *3*(1), Article 1.

Kvalem, I. L., Træen, B., & Iantaffi, A. (2016). Internet pornography use, body ideals, and sexual self-esteem in Norwegian gay and bisexual men. *Journal of Homosexuality*, *63*(4), 522–540.

Leickly, E., Nelson, K., & Simoni, J. (2017). Sexually explicit online media, body satisfaction, and partner expectations among men who have sex with men: A qualitative study. *Sexuality Research and Social Policy*, *14*(3), 270–274.

Levine, M. P., & Harrison, K. (2009). Effects of media on eating disorders and body image. In *Media effects* (pp. 506–532). Routledge. ISBN: 9780203877111

Lewczuk, K., Wójcik, A., & Gola, M. (2022). Increase in the prevalence of online pornography use: Objective data analysis from the period between 2004 and 2016 in Poland. *Archives of Sexual Behavior*, 51, 1157-1171.

Lladó, G., & González-Soltero, R. (2017). Anorexia and bulimia nervosa: Virtual diffusion of the disease as a lifestyle. *Nutricion Hospitalaria*, *34*(3), 693–701.

Lopes, R., Melo, R., & Dias Pereira, B. (2020). Orthorexia nervosa and comorbid depression successfully treated with mirtazapine: A case report. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity*, *25*(1), 163–167. do

Lotfi-Hajilo, N., Zarabian, M.-K., Ghodsi, P., & Shamsaei, M. M. (2017). Comparing of Symptoms, Defense Mechanisms and Coping Styles in Women and Men With Borderline Personality Disorder. *Avicenna Journal of Neuro Psycho Physiology*, *4*(3), 113–120.

Maheux, A. J., Roberts, S. R., Evans, R., Widman, L., & Choukas-Bradley, S. (2021a). Associations between adolescents' pornography consumption and self-objectification, body comparison, and body shame. *Body Image*, *37*, 89–93.

Marks, R. J., De Foe, A., & Collett, J. (2020). The pursuit of wellness: Social media, body image and eating disorders. *Children and Youth Services Review*, *119*, 105659.

Martin-Wagar, C. A., & Weigold, I. K. (2023). Internalized Stigma as a Transdiagnostic Factor for Women with Eating Disorders. *Eating Disorders*, *31*(2), 173–190.

Mazzeo, S. E., & Bulik, C. M. (2009). Environmental and genetic risk factors for eating disorders: What the clinician needs to know. *Child and Adolescent Psychiatric Clinics of North America*, *18*(1), 67–82.

Michaels, M. S., Parent, M. C., & Moradi, B. (2013). Does exposure to muscularity-idealizing images have self-objectification consequences for heterosexual and sexual minority men? *Psychology of Men & Masculinity, 14*(2), 175–183.

Mills, R. (1998). Cyber: Sexual chat on the Internet. *Journal of Popular Culture*, *32*(3), 31.

Morgan, J. F., Reid, F., & Lacey, J. H. (1999). The SCOFF questionnaire: Assessment of a new screening tool for eating disorders. *Bmj*, *319*(7223), 1467–1468.

Moroze, R. M., Dunn, T. M., Holland, J. C., Yager, J., & Weintraub, P. (2015). Microthinking about micronutrients: A case of transition from obsessions about healthy eating to near-fatal "orthorexia nervosa" and proposed diagnostic criteria. *Psychosomatics*, *56*(4), 397–403.

Morrison, T. G., Morrison, M. A., & Bradley, B. A. (2007). Correlates of gay men's self-reported exposure to pornography. *International Journal of Sexual Health*, *19*(2), 33–43.

Mustelin, L., Bulik, C. M., Kaprio, J., & Keski-Rahkonen, A. (2017). Prevalence and correlates of binge eating disorder related features in the community. *Appetite*, *109*, 165–171.

Newman, D. A. (2014). Missing data: Five practical guidelines. *Organizational Research Methods*, *17*(4), 372–411.

Öberg, P., & Tornstam, L. (1999). Body images among men and women of different ages. *Ageing & Society*, *19*(5), 629–644.

O'Brien, J. E., Li, W., & Burton, D. L. (2015). Eating disordered behaviors and body disapproval in adolescent males adjudicated for sexual and nonsexual crimes. *Journal of Child Sexual Abuse*, *24*(8), 922–942.

Oliver, M. B., & Hyde, J. S. (1993). Gender differences in sexuality: A meta-analysis. *Psychological Bulletin, 114*(1), 29–51.

Paslakis, G., Chiclana Actis, C., & Mestre-Bach, G. (2022). Associations between pornography exposure, body image and sexual body image: A systematic review. *Journal of Health Psychology*, *27*(3), 743–760.

Pedram, P., Wadden, D., Amini, P., Gulliver, W., Randell, E., Cahill, F., Vasdev, S., Goodridge, A., Carter, J. C., & Zhai, G. (2013). Food addiction: Its prevalence and significant association with obesity in the general population. *PloS One*, *8*(9), e74832.

Pennesi, J.-L., & Wade, T. D. (2016). A systematic review of the existing models of disordered eating: Do they inform the development of effective interventions? *Clinical Psychology Review*, *43*, 175–192.

Perry, S. L., & Whitehead, A. L. (2019). Only bad for believers? Religion, pornography use, and sexual satisfaction among American men. *Journal of Sex Research*, *56*(1), 50–61.

Peter, J., & Valkenburg, P. M. (2011). The influence of sexually explicit internet material on sexual risk behavior: A comparison of adolescents and adults. *Journal of Health Communication*, *16*(7), 750–765.

Peter, J., & Valkenburg, P. M. (2014). Does exposure to sexually explicit Internet material increase body dissatisfaction? A longitudinal study. *Computers in Human Behavior*, *36*, 297–307.

Poulsen, F. O., Busby, D. M., & Galovan, A. M. (2013). Pornography use: Who uses it and how it is associated with couple outcomes. *Journal of Sex Research*, *50*(1), 72–83.

Praxedes DR, Silva-Júnior AE, Macena ML, et al. Prevalence of food addiction determined by the Yale Food Addiction Scale and associated factors: A systematic review with meta-analysis. *Eur Eat Disord Rev*. 2022;30(2):85-95

Probst, M., Vandereycken, W., Coppenolle, H. V., & Vanderlinden, J. (1995). The Body Attitude Test for patients with an eating disorder: Psychometric characteristics of a new questionnaire. *Eating Disorders*, *3*(2), 133–144.

Quittkat, H. L., Hartmann, A. S., Düsing, R., Buhlmann, U., & Vocks, S. (2019). Body dissatisfaction, importance of appearance, and body appreciation in men and women over the lifespan. *Frontiers in Psychiatry*, *10*, 864.

Ramos-Galarza, C., López-Cárdenas, M. J., & Cruz-Cárdenas, J. (2023). Impact of Technology on Eating Disorders. In A. K. Nagar, D. Singh Jat, D. K. Mishra, & A. Joshi (Eds.), *Intelligent Sustainable Systems* (Vol. 579). Springer.

Rissel, C., Richters, J., De Visser, R. O., McKee, A., Yeung, A., & Caruana, T. (2017a). A profile of pornography users in Australia: Findings from the Second Study Health Relationship. *Journal of Sex Research*, *54*(2), 227–240.

Rothman, E. F. (2021). *Pornography and public health*. Oxford University Press.

Rodgers, R., & Chabrol, H. (2009). Parental attitudes, body image disturbance and disordered eating amongst adolescents and young adults: A review. *European Eating Disorders Review: The Professional Journal of the Eating Disorders Association*, *17*(2), 137-151

Rowland, D. L., & Uribe, D. (2020). Pornography use: What do cross-cultural patterns tell us? In D. L. Rowland & E. A. Jannini (Eds.). *Cultural differences and the practice of sexual medicine: A Guide for Sexual Health Practitioners*, (pp. 317–334). Springer.

Schaefer, L. M., & Thompson, J. K. (2018). Self-objectification and disordered eating: A meta-analysis. *International Journal of Eating Disorders*, *51*(6), 483–502.

Schulte, E. M., Smeal, J. K., & Gearhardt, A. N. (2017). Foods are differentially associated with subjective effect report questions of abuse liability. *PloS One*, *12*(8), e0184220.

Schulte EM, Sonneville KR, Gearhardt AN. Subjective experiences of highly processed food consumption in individuals with food addiction. *Psychology of Addictive Behavior* 2019 Mar;33(2):144-153.

Sevic, S., Ciprić, A., Buško, V., & Štulhofer, A. (2020). The relationship between the use of social networking sites and sexually explicit material, the internalization of appearance ideals and body self-surveillance: Results from a longitudinal study of male adolescents. *Journal of Youth and Adolescence*, *49*(2), 383–398.

Singareddy, C., Shrestha, S., Zheng, A., Harlow, B. L., Barrington-Trimis, J. L., & Harlow, A. F. (2025). Prospective association of symptoms of depression and anxiety with pornography viewing frequency among young adults. *Archives of Sexual Behavior*, *54*(2), 749–759.

Šmahel, D., Macháčková, H., Šmahelová, M., Čevelíček, M., Almenara, C. A., & Holubčíková, J. (2018). *Digital technology, eating behaviors, and eating disorders*. Springer.

Solano, I., Eaton, N. R., & O'Leary, K. D. (2020). Pornography consumption, modality and function in a large internet sample. *Journal of Sex Research*, 57, 92-103.

Stewart, D. N., & Szymanski, D. M. (2012). Young adult women's reports of their male romantic partner's pornography use as a correlate of their self-esteem, relationship quality, and sexual satisfaction. *Sex Roles*, *67*, 257–271.

Striegel-Moore RH, Silberstein LR, Rodin J. Toward an understanding of risk factors for bulimia. *Am Psychol*. 1986;41(3):246-263.

Striegel-Moore, R. H., Rosselli, F., Perrin, N., DeBar, L., Wilson, G. T., May, A., & Kraemer, H. C. (2009). Gender difference in the prevalence of eating disorder symptoms. *International Journal of Eating Disorders*, *42*(5), 471–474.

Sun, C., Bridges, A., Johnson, J. A., & Ezzell, M. B. (2016). Pornography and the male sexual script: An analysis of consumption and sexual relations. *Archives of Sexual Behavior*, *45*(4), 983–994.

Štulhofer, A., Wiessner, C., Koletić, G., Pietras, L., & Briken, P. (2022). bod…

Tamres, L. K., Janicki, D., & Helgeson, V. S. (2002). Sex differences in coping behavior: A meta-analytic review and an examination of relative coping. *Personality and Social Psychology Review*, *6*(1), 2–30.

Tiggemann, M., & Lynch, J. E. (2001). Body image across the life span in adult women: The role of self-objectification. *Developmental Psychology, 37*(2), 243–253

Tiggemann, M., & Raven, M. (1998). Dimensions of control in bulimia and anorexia nervosa: Internal control, desire for control, or fear of losing self-control? *Eating Disorders*, *6*(1), 65–71.

Tolosa-Sola, I., Gunnard, K., Giménez Muniesa, C., Casals, L., Grau, A., & Farré, J. M. (2019). Body dissatisfaction and eating disorder symptomatology: Which factors interfere with sexuality in women with eating disorders? *Journal of Health Psychology*, *24*(11), 1526–1535.

Træen, B., Spitznogle, K., & Beverfjord, A. (2004). Attitudes and use of pornography in the Norwegian population 2002. *Journal of Sex Research*, *41*(2), 193–200.

Thompson, J. K., Coovert, M. D., & Stormer, S. M. (1999). Body image, social comparison, and eating disturbance: A covariance structure modeling investigation. *International Journal of Eating Disorders*, *26*(1), 43-51.

Thompson JK, van den Berg P, Roehrig M, Guarda AS, Heinberg LJ. The Sociocultural Attitudes Towards Appearance scale-3 (SATAQ-3): development and validation. Int J Eat Disord. 2004 Apr;35(3):293-304.

Tury, F., Günther, R., Szabo, P., & Forgacs, A. (1994). Epidemiologic data on eating disorders in Hungary: Recent results. *Orvosi Hetilap*, *135*(15), 787–791

Túry, F., Szabó, P., Dukay-Szabó, S., Szumska, I., Simon, D., & Rathner, G. (2021). Eating disorder characteristics among Hungarian medical students: Changes between 1989 and 2011. *Journal of Behavioral Addictions*, *9*(4), 1079–1087.

Tylka, T. L. (2004). The Relation Between Body Dissatisfaction and Eating Disorder Symptomatology: An Analysis of Moderating Variables. *Journal of Counseling Psychology, 51*(2), 178–191.

Tylka, T. L., & Calogero, R. M. (2019). Perceptions of male partner pressure to be thin and pornography use: Associations with eating disorder symptomatology in a community sample of adult women. *International Journal of Eating Disorders*, *52*(2), 189–194.

Tylka, T. L., & Kroon Van Diest, A. M. (2015). You looking at her "hot" body may not be "cool" for me: Integrating male partners' pornography use into objectification theory for women. *Psychology of Women Quarterly*, *39*(1), 67–84.

Van Eeden AE, van Hoeken D, Hoek HW. Incidence, prevalence and mortality of anorexia nervosa and bulimia nervosa. Curr Opin Psychiatry. 2021 Nov 1;34(6):515 -524.

Volpe, U., Tortorella, A., Manchia, M., Monteleone, A. M., Albert, U., & Monteleone, P. (2016). Eating disorders: What age at onset? *Psychiatry Research*, *238*, 225–227.

Whitfield, T. H., Rendina, H. J., Grov, C., & Parsons, J. T. (2018). Viewing sexually explicit media and its association with mental health among gay and bisexual men across the U.S. *Archives of Sexual Behavior*, *47*(4), 1163–1172.

Woertman, L., & Van Den Brink, F. (2012). Body Image and Female Sexual Functioning and Behavior: A Review. *Journal of Sex Research*, *49*(2–3), 184–211.

Wright, P. J., & Randall, A. K. (2012). Internet pornography exposure and risky sexual behavior among adult males in the United States. *Computers in Human Behavior*, *28*(4), 1410–1416.

Zhou, S., Zhao, Y., Rizvi, R., Bian, J., Haynos, A. F., & Zhang, R. (2019). *Analysis of Twitter to identify topics related to eating disorder symptoms*. 1–4. 2019 IEEE International Conference on Healthcare Informatics (ICHI) (pp. 1-4), Xi'an, China

IV/Table 1.

Sociodemographic Characteristics of Participants

Characteristics	*N*	%	*M*	*SD*
General population	3764	100		
Gender				
Men	1815	51.78		
Women	1949	48.21		
Marital Status				
Single	2103	55.87		
Married	1504	39.95		

Widow	10	0.26		
Divorced	86	2.28		
Did not respond	61	1.62		
Age				
23-29	957	25.42	23	4.74
29-33	1133	30.10		
34-39	1674	44.47		
Highest level of education				
Primary school	3	1		
Vocational school 1-3 grades	144	3.8		
Vocational school 4-5 grades	779	20.5		
Vocational high school	1161	30.5		
High school	701	18.4		
Higher vocational education after high school graduation,	291	7.7		
Higher vocational education, higher technical school (not college)	114	3.0		
College, BA/BSc education	425	11.2		
College, MA/MSc or undivided (integrated) education	128	3.4		
Post-graduated education, doctoral school (PhD, DLA)	18	4		

Note. M = mean, *SD* = standard deviation, N = sample size, %= percentage

IV/Table 2.

Reliability Indices, Comparisons of Men's and Women's Pornography Use Frequency, Body Dissatisfaction, and Disordered Eating Behavior

Variables	Range	ω	α	Total sample (N=3764) *M* (SD)	Men (n=1815) *M* (SD)	Women (n=1949) *M* (SD)	Cohen's *d*	*p*
1. Pornography use frequency T1 [a]	0-10			1.60 (2.33)	2.45 (2.59)	0.98 (2.03)	0.63	< .001
2. Pornography use frequency T2 [a]	0-10			0.71 (1.78)	1.80 (2.81)	0.70 (1.80)	0.55	< 0.01
3. Disordered eating behavior T1[b]	0-2	.74	.73	0.06 (0.16)	0.05 (0.15)	0.07 (0.18)	0.17	< 0.01
4. Disordered eating behavior T2 [b]	0-2	.71	.81	0.07 (0.21)	0.07 (0.22)	0.08 (0.20)	0.21	< 0.01
5. Body dissatisfaction T1 [c]	0-4	.84	.84	1.07 (0.02)	0.80 (0.94)	1.27 (1.21)	0.43	< 0.01
6. Body dissatisfaction T2 [c]	0-4	.92	.92	0.89 (0.02)	0.77 (1.04)	0.98 (1.13)	0.19	< 0.01

Note. Skew. = Skewness; Kurt. = Kurtosis; a = 0 = not once in the last year, 1= 1 time, 2 = 2-6 times last year, 3 = 7-11 times last year, 4 = 1 time per month, 5 = 2-3 times a month, 6 = 1 time per week, 7 = 2-3 times a week 8=4-5 times a week, 9 = 6-7 times a week, 10 = more than 7 times a week; b = 1 = yes, 2 = No, c= 0 = never, 1 = rarely, 2 = sometimes, 3 = often, 4 = usually, 5 = always; M = mean; SD = standard deviation

IV/Table 3.

Descriptive Statistics, Correlation Between Pornography Use Frequency, Disordered Eating Behavior, and Body Dissatisfaction

Variables	(Skew) (SE)	(Kurt) (SE)	Range	M (*SD)*	1	2	3	4	5	6
1. Pornography use frequency T1 [a]	2.93 (0.04)	6.62 (0.08)	0-10	1.60 (2.33)	1					
2. Pornography use frequency T2 [a]	2.62 (0.04)	6.07 (0.09)	0-10	0.70 (1.77)	.15**	1				
3. Disordered eating T1 [b]	3.01 (0.04)	9.28 (0.09)	0-2	0.06 (0.16)	.12**	.03	1			
4. Disordered eating T2 [b]	3.11 (0.04)	9.25 (0.09)	0-2	0.08 (0.21)	.19**	-.01	.17**	1		
5.Body dissatisfaction T1 [c]	0.99 (0.04)	0.56 (0.09)	0-4	1.07 (0.02)	.11**	.01	.50**	.12**	1	
6.Body dissatisfaction T2 [c]	1.23 (0.04)	0.96 (0.09)	0-4	0.89 (0.21)	.09**	.10**	.26**	.55**	.25**	1

Note. Skew. = Skewness; Kurt. = Kurtosis; a = 0 = not once in the last year, 1= 1 time, 2 = 2-6 times last year, 3 = 7-11 times last year, 4 = 1 time per month, 5 = 2-3 times a month, 6 = 1 time per week, 7 = 2-3 times a week 8=4-5 times a week, 9 = 6-7 times a week, 10 = more than 7 times a week; b = 1 = yes, 2 = No; c= 0 = never, 1 = rarely, 2 = sometimes, 3 = often, 4 = usually, 5 = always; M = mean; SD = standard deviation *$p < .05$. **$p < 0.01$.

IV/Table 4.

Examination of The Relationship Between Pornography Use Frequency and Disordered Eating Behavior And The Mediating Role of Body Dissatisfaction Between Pornography Use Frequency and Disordered Eating Behavior

Models	χ^2 (df)	CFI	TLI	RMSEA	RMSEA (90% CI)
Model A: Fully saturated model, no mediating variable (total sample)	0.000 (0)	1.000	1.000	0.000	0.000-0.000
Model B: Fully saturated model no mediating variable, with grouping by gender	0.000 (0)	1.000	1.000	0.000	0.000-0.000
Model C: Same as Model B, parameters constrained to be equal between groups	32.085 (6)	0.828	0.714	0.048	0.033- 0.065
Model D: Same as Model A, with body dissatisfaction as a mediator	0.000 (0)	1.000	1.000	0.000	0.000-0.000
Model E: Same as Model D with grouping by gender	0.000 (0)	1.000	1.000	0.000	0.000-0.000
Model F: Same as Model E, parameters constrained to be equal between groups	714.74 (24)	0.309	0.309	0.124	0.116-0.132

Note. $\chi 2$ = Chi-square test; df = degrees of freedom; CFI = comparative fit index; TLI = Tucker–Lewis Index; RMSEA = root-mean-square error of approximation; 90% CI = 90% confidence interval of RMSEA.

IV/Table 5.

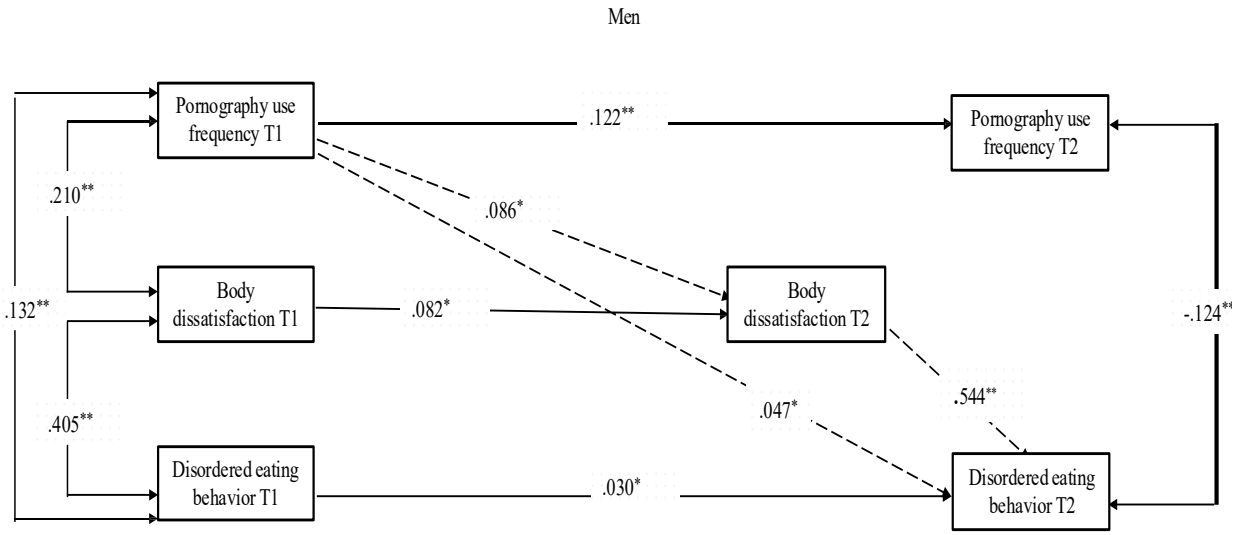
Parameter Estimates for Cross-Lagged Panel Mediation Model of Pornography Use Frequency, Body Dissatisfaction and Disordered Eating Behavior

Men					β	b	*p*-value
Direct Effect							
Pornography use frequency T1	→	Disordered eating behavior T2			.101	.009	.000
Disordered eating behavior T1	→	Pornography use frequency T2			.023	.354	.510
Indirect effect							
Pornography use frequency T1	→	Body dissatisfaction T2	→	Disordered eating behavior T2	.047	.004	.011
Women							
Direct Effect							
Pornography use frequency T1	→	Disordered eating behavior T2			.182	.019	.000
Disordered eating behavior T1	→	Pornography use frequency T2			.060	.369	.510
Indirect effect							
Pornography use frequency T1	→	Body dissatisfaction T2	→	Disordered eating behavior T2	.033	.003	.047

Note. T1 represents the first data collection wave and T2 represents the second data collection wave.

IV/Figure 1.

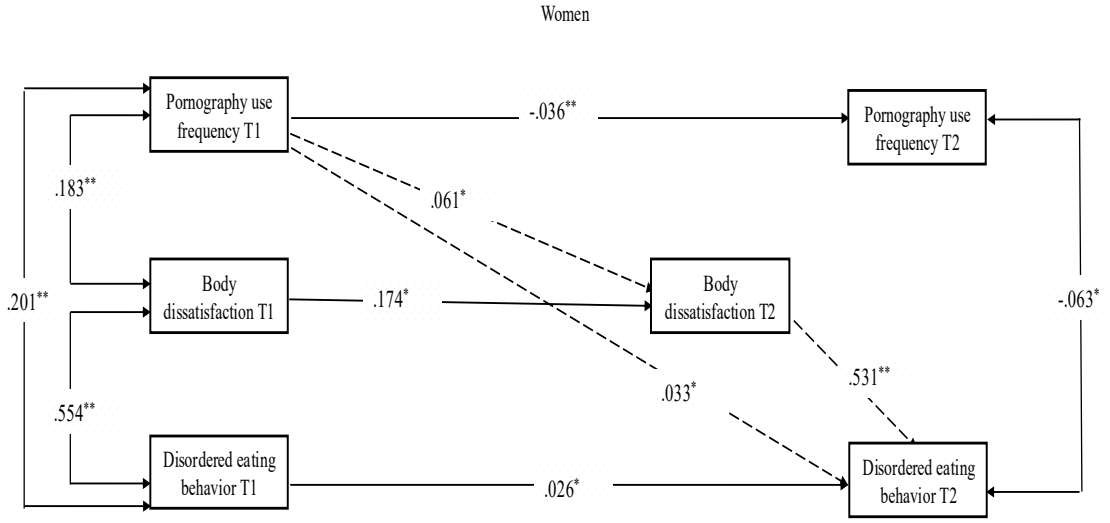
Mediation Model Regarding the Mediating Role of Body Dissatisfaction in The Relationship Between Pornography Use Frequency and Disordered Eating Behavior Among Men



Note. One-headed arrows represent standardized regression weights. Two- headed arrows represent standardized correlations. The dotted line presents the mediating role of body dissatisfaction. T1 represents the first data collection wave and T2 represents the second data collection wave, *p <0.05, **p < 0.01.

V/Figure 2.

Mediation Model Regarding the Mediating Role of Body Dissatisfaction in The Relationship Between Pornography Use Frequency and Disordered Eating Behavior among women



Note. One-headed arrows represent standardized regression weights. Two- headed arrows represent standardized correlations. The dotted line presents the mediating role of body dissatisfaction. T1 represents the first data collection wave and T2 represents the second data collection wave, *p <0.05, **p < 0.01.

V. General Discussion

V/1. Overview of the results and major contributions to the literature

This dissertation aimed to address existing research gaps regarding the associations between non-problematic pornography use (specifically PUF), PPU, body image issues (specifically BD), and eating disorders (specifically DEB). The three included studies collectively offer a more comprehensive understanding of these relationships by reporting both cross-sectional and longitudinal findings while accounting for gender differences. This section of the discussion provides a brief overview of the findings of each study, highlighting the contributions of the three studies included in this dissertation.

Given that previous studies to date have employed a cross-sectional design and mostly included male samples, our study addresses these gaps. One of the main contributions of this dissertation is its expansion of the current literature, revealing both longitudinal and bidirectional associations between PPU, PUF, and BD, as well as the longitudinal mediating role of BD in the relationship between PUF and DEB among both men and women. An overview of the results is presented in Table 5.1.

V/1.1. Main findings and interpretation of the included studies

Our first study examined the cross-sectional and longitudinal associations between PUF and BD, considering the role of masturbation frequency as a control variable and gender differences. Our results suggest a bidirectional association between PUF and BD among men, but not women. Moreover, we did not observe a significant association between PUF and BD for women. These gender differences indicate that, for men, not only do PUF predict BD, but baseline BD symptoms predict PUF, indicating a reciprocal association. Moreover, it also indicates that PUF is not a significant contributor to BD in women. The lack of this significant association in women, as well as a significant bidirectional positive association in men, might reflect different underlying factors associated with PUF and BD across genders.

Men reported greater levels of PUF and masturbation frequency than women both cross-sectionally and longitudinally, while women reported greater BD than men. These greater levels of PUF and masturbation frequency may be associated with men's greater sexual desire than women (Baughman et al., 2014). These findings are also consistent with previous studies, which have repeatedly reported greater PUF for men

than for women (Grubbs et al., 2019; Lewczuk et al., 2019; Rissel et al., 2017). Concerning the greater level of BD observed in women, it can be due to women being more sensitive than men about physical appearance (Quittkat et al., 2019). Considering the positive correlation between PUF and masturbation frequency, it is plausible that individuals may use pornography to facilitate masturbation. Consequently, it is reasonable for men to report higher masturbation frequency (Prause, 2019).

Our cross-sectional and longitudinal findings on the association between PUF and BD are consistent with the Social Comparison Theory (Festinger, 1954) and the Self Objectification Theory (Fredrickson et al., 1977). The former suggests that a person may compare themselves to others when objective references are missing. Since pornography often features idealized bodies with leanness and muscularity, it promotes upward social comparison (Baughman et al., 2014). This comparison between the actual self and the idealized bodies shown in pornography can create gaps between one's real and ideal self, increasing dissatisfaction with one's own body due to upward comparison (Myers & Crowther, 2009; Pedalino & Camerini, 2022). Similar to the Social Comparison Theory, the Objectification Theory states that sustained exposure to objectifying content can lead to self-objectification, causing individuals to evaluate themselves based on what they see. Because pornography often depicts idealized bodies that are challenging to attain, users may internalize these body representations. Furthermore, since pornography frequently objectifies the bodies it displays, it makes it more likely for users to experience BD (Daniel et al., 2014).

Overall, these findings suggest that while cross-sectional studies align with our study's findings (Paslakis et al., 2022), a longitudinal design may provide insight into whether repeated exposure to such material can gradually worsen one's body image over time. Our longitudinal findings also align with those of a previous longitudinal study, which observed a positive and significant association between PUF and BD among men but not among women (Peter & Valkenburg, 2014). It is essential to note that, although a previous study employed a six-month time interval, our study utilized a one-year interval, as recommended by prior research (Lühr et al., 2022). This approach addresses a significant methodological gap that our study helps to fill.

These findings indicate that PUF may not be a strong predictor of BD in women over time. Considering the current literature, gender differences in PUF may be attributed to the extent to which pornography is perceived as real. In particular, people

who perceive what they see as realistic may be more affected, as they are less critical of what they are exposed to (Wright, 2013). Previous study suggested that women had a more accurate understanding of its content when they engaged in greater PUF (Vogels, 2018). Therefore, it may be hypothesized that women in our study, when engaged in PUF, might have had a greater understanding of the content, which could be the reason for the non-significant association between PUF and BD among women. In a previous study examining the moderating role of perceived realism on the relationship between PUF and BD among men, no moderating effect of perceived realism was observed (Gewirtz-Meydan et al., 2024). However, it may be significant in the association between PUF and BD among women. Future studies could consider using perceived realism as a moderator to determine whether this association is significant for women. Based on these findings, we can infer that, in the short term, PUF may be associated with BD, regardless of gender differences. However, in the long term, only men may experience BD in relation to PUF.

Furthermore, the findings of this dissertation indicated that higher baseline BD was associated with greater PUF among men over time. There are several possible explanations for these findings. For example, BD is positively associated with depression (Barnes et al., 2020) and social anxiety (Jarrar et al., 2022). One of the most frequent symptoms of depression is anhedonia, which is defined as a loss of interest and/or the capacity to experience pleasure in previously enjoyed activities (World Health Organization, 2013). A previous comprehensive meta-analysis indicated that individuals experiencing depression are more likely to report sexual dysfunction (Goncalves et al., 2023), which is one of the consequences of anhedonia. Moreover, in another study, individuals with positive body image reported greater sexual desire and sexual function compared to individuals with a negative body image (Afshari et al., 2016). Overall, in light of these findings, BD may negatively contribute to individuals' mental health, thereby leading to reduced sexual satisfaction and socialization. Therefore, it can be assumed that individuals with BD may refrain from engaging in real-life sexual experiences (Brink et al., 2018), which, in turn, could lead them to prefer more solitary sexual activities such as pornography use. In previous studies (Paslakis et al., 2022) on PUF and BD, all studies used PUF as an exogenous/independent variable, applying the Social Comparison Theory, and neglected the potential bidirectional association that was demonstrated in our study.

Nevertheless, the factors contributing to the association between BD-induced PUF that we observed remain unidentified. As we previously highlighted, variables such as social anxiety and loneliness, which are associated with BD, may explain this association. Therefore, future research should consider these variables as potential mediators to test these hypotheses.

Our second study examined the cross-sectional and longitudinal associations between PPU and BD, considering differences. Concerning our cross-sectional findings, PPU exhibited a positive association with BD. At baseline, a significant positive cross-sectional association was observed between PPU and BD in men, whereas among women, this association was significant at both waves. When it comes to longitudinal findings, our results suggest significant positive associations between prior PPU and later BD among both men and women. Likewise, we also observed a positive association between prior BD and later PPU among both men and women. Our findings suggest a potentially bidirectional association between PPU and BD regardless of gender.

Consistent with the Social Comparison Theory, our findings further emphasized how upward social comparisons relate to BD in relation to PPU (Festinger, 1954). To the best of our knowledge, this is the first longitudinal study examining the association between PPU and BD. Moreover, this longitudinal association between PPU and BD was stronger in men than in women. This significant finding, along with the stronger BD in relation to PPU in men, may be attributed to certain factors. For example, in the context of PPU, individuals may tend to engage in more extreme pornographic content owing to the desensitization feature of addictive behaviors (Binnie & Reavey, 2020; Lewczuk et al., 2022). Thus, individuals with PPU may confront more idealized bodies that are unrealistic, potentially distorting their reality of normal body size than PPU. The extreme nature of pornographic content, coupled with the overuse and dysregulated use, along with exaggerated representations of bodies (McKee et al., 2008), may help explain the general association between PPU and BD. Given that PPU is characterized by dysregulated and excessive use, which may result in exposure to exaggerated bodies, it may contribute to BD; therefore, PPU rather than PUF may worsen women's critical interpretation of bodies presented in pornography.

Returning to the Social Comparison Theory (Festinger, 1954), it may also provide an alternative explanation for this association. In a previous study, PPU was

found to predict greater engagement in social body comparison, which, in turn, led to BD (Gewirtz-Meydan et al., 2024). Given that men tend to report greater levels of PPU than women (Rissel et al., 2017), it may result in greater exposure to idealized body images presented in pornography, which, in turn, may lead to greater social comparison resulting in greater BD. Therefore, a greater degree of exposure to such media may result in a greater degree of BD. Moreover, in a previous cross-sectional study, women did not report BD in relation to PPU (Borgogna et al., 2018). This finding is inconsistent with our cross-sectional and longitudinal findings, as we observed significant positive associations between PPU and BD in both the short and long term. The potential reason for these differences between Borgogna and colleagues' study (2018) and our study might be that many of the women in our sample may have been engaging in content that involves female actors, while in their research, women may have engaged in content that is designed for women (Borgogna et al., 2018). Therefore, if our participants were predominantly watching "female–themed" pornography along with intense use, there might be a cause for an association between PPU and BD, which was absent in the previous study (Borgogna et al., 2018). Moreover, the observed differences may also be attributed to regional variations, considering that the previous study was conducted in the US and included 17% women of color (Borgogna et al., 2018). As women of color report the highest levels of body appreciation, whereas white women report the lowest (Winter et al., 2019), it is possible that this body appreciation may serve as a protective factor, buffering against engaging in social comparisons and later BD. Therefore, as our sample of women consisted of white women, they might be more likely to engage in social comparison as their physical norms align closely with the physical beauty prevalent in pornography.

Moreover, our second study's findings also indicated that greater baseline BD levels were associated with higher PPU levels one year later. There might be several possible explanations for these findings. According to the I-PACE model (Brand et al., 2016, 2019, 2025), addictive behaviors can be used as a tool to cope with negative circumstances and experienced stress. Given that BD is positively associated with negative feelings, one can engage in pornography use to cope with their negative mood states associated with BD, and greater negative feelings may, in turn, intensify pornography use, which, in turn, may result in PPU in some individuals (Kraus et al., 2018). Furthermore, this can be explained by the negative reinforcement effect of

addictive behaviors, such as PPU (Brand et al., 2025). For example, addictive behaviors at the beginning provide gratification (positive reinforcement), and in their later phases, they become a tool to cope with negative feelings (negative reinforcement). Thus, PPU can function as a coping tool to overcome feelings associated with BD. This longitudinal positive association between BD and PPU is a novel finding, as previous studies only examined PPU and BD cross-sectionally among men (Gewirtz-Meydan & Spivak-Lavi, 2023) and women, limiting our understanding of the directionality of the association (Borgogna et al., 2018). Thus, future studies are warranted to further explore these associations. Furthermore, based on our findings, PPU was more stable than PUF over time, suggesting that individuals with PPU showed consistency in their behavior, which may be due to the tolerance feature of PPU, as individuals with PPU may need to engage more in this behavior to experience the same pleasure from the activity than before (Bőthe et al., 2018). This finding is consistent with a previous study, which demonstrated that individuals with PPU showed behavioral stability across three waves over 12 months (Engelhardt et al., 2025).

Given the positive and significant association between PUF and BD (Paslakis et al., 2022) as well as BD being a key risk factor for DEB (Barakat et al., 2023), in our third study, we sought to examine the cross-sectional and longitudinal associations between PUF and DEB, while considering the mediating role of BD over one year. In addition, we also explored potential gender differences, as previous studies have not examined the association between PUF and DEB among women (Duggan & McCreary, 2013b; Gewirtz-Meydan & Spivak-Lavi, 2023b; Griffiths et al., 2018). Regarding the cross-sectional associations between PUF, BD, and DEB, our results indicated a significant positive association between all variables among both genders. These findings are consistent with previous studies that observed positive significant associations between PUF and DEB (Duggan & McCreary, 2013; Griffiths et al., 2018). Moreover, concerning the longitudinal findings, our study's results suggested a positive association between PUF and DEB. Specifically, an individual's baseline PUF predicted later DEB through an increased BD over time. This finding indicates that PUF may be a risk factor for DEB in both men and women due to BD induced by PUF.

Given that pornography often depicts lean female and muscular male performers (McKee et al., 2008), it can be assumed that PUF may be positively associated with BD among both men and women, which, in turn, could increase DEB. Moreover, although

PUF differs from PPU in terms of intensity and its addictive features (Bőthe et al., 2020), a previous study also observed a positive association between PPU and DEB through social comparison and body image issues (Gewirtz-Meydan & Spivak-Lavi, 2023). Based on these findings, it is reasonable to infer that individuals may experience DEB regardless of whether exposure to such material (i.e., pornography) is deemed problematic. Overall, our study demonstrated that the baseline level of PUF gradually led to BD, which ultimately resulted in DEB over time.

Moreover, it is important to note that previous studies were conducted only among men, and our study extended previous studies' findings to the women. Notably, the association between PUF and DEB was stronger in women than in men in the present study. This difference could be attributed to women's greater levels of susceptibility to external influences such as the media (Alanazi et al., 2019). The Self-Objectification Theory posits that both women and men can experience self-objectification; however, women are more predisposed to this phenomenon than men. These findings are consistent with a previous meta-analysis, which reported that women are at a heightened risk for DEB as they engage more in self-objectification than men (Schaefer & Thompson, 2018). Moreover, the greater overvaluation of leanness, which is common in Western culture, might contribute to the development and maintenance of DEB among women (Barakat et al., 2023).

To understand the underlying mechanisms of how baseline levels of PUF might be associated with greater DEB through BD overtime, we can use the Social Comparison Theory (Festinger, 1954) and the Tripartite Influence Model (Thompson et al., 2004). The Tripartite Model indicates that some factors directly or indirectly influence an individual's perception of their physical appearance. Direct influence is exerted through interactions with peers and family members, whereas indirect influence occurs without physical interaction, being conveyed through messages transferred via media. Particularly, given that pornography portrays specific bodies, including larger penises, shaped genitals, lean and muscular bodies, this one type of representation of bodies may change the perception of individuals about what a normal body should look like (McKee et al., 2008). Following the Social Comparison Theory and the Tripartite Model as well, individuals may engage in upward comparison, and they may experience discrepancies between the bodies represented in pornography and their own body, resulting in BD. Later, this experienced BD may result in DEB.

V/1.2. Overview of contributions

Taken together, our studies' results provide a comprehensive understanding by addressing the research gaps overviewed in the introduction and expanding the current literature in several key areas. Our findings suggested that the associations of PUF and PPU with BD can differ based on gender. Men could experience BD in relation to both PUF and PPU, while women exhibit BD only in relation to PPU. Moreover, we also observed DEB in relation to PUF both in men and women over time. Furthermore, given the design of our studies, we introduced novel findings to the current literature. Our studies revealed that baseline body image problems can later contribute to PUF in only men and PPU for both men and women, indicating that not only can such material (i.e., pornography) result in BD, but existing BD can later contribute to engagement with such material. It is important to note that the effect sizes in the presented studies were quite weak, which suggests that other variables may play a stronger role in BD and DEB than PUF and PPU. For example, previous studies that relied on the Social Comparison Theory to explain this association used upward social comparison as an additional variable explaining the association between pornography use and BD (Gewirtz-Meydan et al., 2024). Additional variables, such as the internalization of body ideals, perceived reality, and perfectionism, warrant further investigation. However, perceived realism was used as a moderating variable in previous studies; the mediating effect of perceived reality can be tested in future studies. According to our findings, Individuals engaging in pornography use may be at risk of BD. Therefore, if they do not regulate their pornography use long-term, they may develop BD, which could lead to DEB. Moreover, considering the bidirectional association between PUF and BD as well as PPU and BD, therapists should also consider individuals' BD symptoms, as these may ultimately result in greater PUF and later PPU. Given that pornography use is pervasive, contemporary therapeutic interventions should integrate digital literacy to help individuals critically interpret portrayals of bodies. Therefore, digital literacy tailored to pornography can play a buffering role for BD associated with PUF (Dawson et al., 2020; Johnson, 2026). Furthermore, policymakers may incorporate media literacy education into sexual education curricula to address the unrealistic expectations promoted by pornography (Balliet & Ford, 2025).

Additionally, previous treatments, such as cognitive-behavioral therapy (CBT) and acceptance and commitment therapy, have primarily focused on addressing the

symptoms of PPU (López-Pinar et al., 2025). Incorporating assessments for BD and integrating targeted interventions when such symptoms are present may enhance treatment efficacy. Given that negative emotions are highly relevant to both PPU and BD, clinicians treating individuals with PPU might seek information about individuals' perceptions of their bodies. In this context, therapists could implement effective CBT techniques that emphasize the modification of automatic and irrational thoughts concerning one's body. Additionally, they may teach individuals effective emotion regulation strategies (e.g., mindfulness) to manage negative emotions that may arise due to BD, thereby reducing PPU.

V/3. Limitations of the present dissertation

This portfolio dissertation addressed important gaps in the current literature, as some of our studies (Studies 2 and 3) are the first to examine the longitudinal associations between PPU and BD, as well as PUF and DEB. However, this dissertation had several limitations that should be taken into consideration when interpreting the results. First, the studies in this dissertation relied on online surveys and interview methods, which were based on the availability of individuals. This approach may lead to response bias, such as recall bias or social desirability bias, due to the sensitive nature of pornography use. Social desirability bias, which is commonly associated with pornography use, may be more pronounced in female participants, given the higher prevalence of pornography use among men compared to women. Consequently, female participants may have reported lower levels of PUF and PPU. Another potential explanation for these findings is that when experience compulsive sexual behaviors, they may engage in other sexual activities (e.g., casual sexual encounters) instead of pornography use (Kowalewska et al., 2020, 2025). Second, we did not define pornography, which might have introduced biases; for example, participants might have interpreted pornography differently while responding to pornography-related questions (Kohut et al., 2020). Third, although we employed a longitudinal approach, it was not possible to determine causal links between the variables in this study. Fourth, we used a four-item scale to measure BD (Czeglédi et al., 2010). However, BD is a complex and multifaceted concept encompassing various aspects of the body, such as appearance, muscularity, and weight (Smolak, 2006). Using a more comprehensive scale, such as the Body Image State Scale (Cash et al., 2002), may capture specific features of this construct more effectively.

Fifth, although previous studies have indicated that pornography use and BD may differ based on sexual orientation, sexual orientation was not assessed in our studies. Sixth, we employed several theories, such as the Social Comparison Theory (Festinger, 1954), the Self-Objectification Theory (Tiggemann & Lynch, 2001), and the Tripartite Model (Thompson et al., 1999), to explain the findings of the studies. However, we did not assess all the constructs of these theories, such as social comparison, internalization, and self-objectification, in the studies presented in this dissertation. Furthermore, beauty ideals may vary across regions, with notable differences between individualistic and collectivist cultures. In collectivist cultures, adherence to group norms (including appearance) might be stronger than that in Europe (Abadeer, 2015). Given that Hungary is a Western country, and previous studies have primarily been conducted in predominantly WEIRD societies, further research is needed in non-WEIRD countries.

V/4. Future recommendations

Given that our studies, as well as previous studies (Paslakis et al., 2022) examining the associations between PUF, BD, and DEB, mainly relied on self-report questionnaires, we recommend that future studies incorporate objective measurement techniques. For example, future studies may employ eye-tracking technologies to analyze attentional biases before and after exposure to bodies in pornographic materials to obtain more objective information (Vraga et al., 2016). Professional and amateur pornography differ in terms of authenticity, with amateur pornography being perceived as more authentic and realistic than professionally produced material (Hald & Štulhofer, 2016). Future research could employ experimental designs to compare the potential effects of exposure to professional and amateur pornography on BD. Moreover, as our sample consisted of individuals from the general population, future research involving treatment-seeking individuals for PPU could help further validate our findings in relation to BD and DEB. Previous research suggests that perceiving pornography as realistic can intensify its impact on individuals, particularly in relation to body image. When people view such content as reflecting real life, they may be more likely to internalize the body ideals it portrays (Tiggemann & Anderberg, 2020). This internalization can foster increased appearance-based comparisons, which may ultimately contribute to higher levels of BD (Dakanalis et al., 2015). Therefore, perceived reality and internalization might be the potential additional variables that need

to be taken into consideration as mediators explaining the association between pornography use and BD. Lastly, given that our studies employed two time points, future research could benefit from incorporating additional time points to assess the long-term trajectories of the associations between PUF, PPU, and BD, as well as PUF and DEB.

V/5. Conclusions

In conclusion, this dissertation aimed to address existing knowledge gaps by examining the association between PClick or tap here to enter text.UF, PPU, and BD, as well as the longitudinal mediating role of BD in the relationship between PUF and DEB, considering gender differences. Our first and second studies' findings revealed a positive bidirectional association between PUF and BD, as well as PPU and BD. Furthermore, our third study revealed positive associations between PUF and DEB over time, as measured by BD. Notably, men reported greater BD in relation to PUF and PPU, while women reported greater DEB in relation to PUF compared to men. Overall, our findings suggest that PUF and PPU may contribute to BD, which, in turn, may result in DEB over time. Moreover, BD may also contribute to PUF and PPU. Therefore, clinicians could adopt integrative therapeutic techniques addressing both emotional challenges and pornography use. Although our findings provide evidence for the associations between PUF, PPU, BD, and DEB, further studies among clinical samples and incorporating more time points are needed to clarify the links between these constructs.

V/Table 1.

Brief Summary of the Studies' Findings Presented in The Dissertation

	Title of the study	Research objective (s)	Key finding (s)
Study 1.	Curves and Pixels: Longitudinal Associations Between Frequency of Pornography Use and Body Dissatisfaction in a Sample of Hungarian Young Adults	Examining the cross-sectional and longitudinal associations between pornography use frequency and body dissatisfaction among men and women.	A significant, weak positive association was observed between pornography use frequency and body dissatisfaction. This association was significant cross-sectionally in both men and women, and longitudinally among men but not among women. This longitudinal association was bidirectional in the case of men.
Study 2.	Bidirectional Positive Associations Between Problematic Pornography Use and Body Dissatisfaction in Women and Men: Findings Among Hungarian Young Adults in a One-Year Longitudinal Study	Examining the cross-sectional and longitudinal associations between problematic pornography use and body dissatisfaction among men and women.	A significant, positive association was observed between problematic pornography use and body dissatisfaction, both cross-sectionally and longitudinally among men and women, and this association was bidirectional in both genders.
Study 3.	A Longitudinal Examination of the Mediating Role of Body Dissatisfaction in the Relationship Between Pornography Use Frequency and Eating Disturbances: A Cross-Lagged Mediation Model	Examining the cross-sectional and longitudinal associations between pornography use frequency and disturbed eating behaviors, while considering the mediating role of body dissatisfaction among men and women.	A significant, positive association was observed between pornography use frequency and disordered eating behaviors among both men and women, both cross-sectionally and longitudinally. Moreover, body dissatisfaction partially mediated the association between of pornography use frequency and disordered eating behaviors among men and women as well.

V/6. References

Abadeer, A. S. (2015). Norms in collectivist versus individualist societies. In *Norms and Gender Discrimination in the Arab World* (pp. 85–101). Springer.

Afshari, P., Houshyar, Z., Javadifar, N., Pourmotahari, F., & Jorfi, M. (2016). The relationship between body image and sexual function in middle-aged women. *Electronic Physician*, *8*(11), 3302.

Alanazi, A. S., Alotaibi, Y. M., Alojan, J. S., Zaidi, U., & Rao, H. M. (2019). Effects of social media contents on the perception of body image. *International Journal of Innovation, Creativity and Change*, *9*(7), 179–196.

Balliet, M., & Ford, J. (2025). *Navigating Realities: A Pornography Literacy and Sexual Health Curriculum for High School Students*. *10*, 1509262.

Barakat, S., McLean, S. A., Bryant, E., Le, A., Marks, P., Touyz, S., & Maguire, S. (2023). Risk factors for eating disorders: Findings from a rapid review. *Journal of Eating Disorders*, *11*(1), 8.

Barnes, M., Abhyankar, P., Dimova, E., & Best, C. (2020). Associations between body dissatisfaction and self-reported anxiety and depression in otherwise healthy men: A systematic review and meta-analysis. *PloS One*, *15*(2), e0229268.

Baughman, H. M., Jonason, P. K., Veselka, L., & Vernon, P. A. (2014). Four shades of sexual fantasies linked to the Dark Triad. *Personality and Individual Differences*, *67*, 47–51.

Binnie, J., & Reavey, P. (2020). Problematic pornography use: Narrative review and a preliminary model. *Sexual and Relationship Therapy*, *35*(2), 137–161.

Borgogna, N. C., Lathan, E. C., & Mitchell, A. (2018). Is women's problematic pornography viewing related to body image or relationship satisfaction? *Sexual Addiction & Compulsivity*, *25*(4), 345–366.

Bőthe, B., Tóth-Király, I., Potenza, M. N., Orosz, G., & Demetrovics, Z. (2020). High-frequency pornography use may not always be problematic. *The Journal of Sexual Medicine*, *17*(4), 793–811.

Bőthe, B., Tóth-Király, I., Zsila, Á., Griffiths, M. D., Demetrovics, Z., & Orosz, G. (2018). The development of the problematic pornography consumption scale (PPCS). *The Journal of Sex Research*, *55*(3), Article 3.

Brand, M., Müller, A., Wegmann, E., Antons, S., Brandtner, A., Müller, S. M., Stark, R., Steins-Loeber, S., & Potenza, M. N. (2025). Current interpretations of the I-

PACE model of behavioral addictions. *Journal of Behavioral Addictions*, *14*(1), 1–17.

Brand, M., Wegmann, E., Stark, R., Müller, A., Wölfling, K., Robbins, T. W., & Potenza, M. N. (2019). The Interaction of Person-Affect-Cognition-Execution (I-PACE) model for addictive behaviors: Update, generalization to addictive behaviors beyond internet-use disorders, and specification of the process character of addictive behaviors. *Neuroscience & Biobehavioral Reviews*, *104*, 1–10.

Brand, M., Young, K. S., Laier, C., Wölfling, K., & Potenza, M. N. (2016). Integrating psychological and neurobiological considerations regarding the development and maintenance of specific Internet-use disorders: An Interaction of Person-Affect-Cognition-Execution (I-PACE) model. *Neuroscience & Biobehavioral Reviews*, *71*, 252–266. https://doi.org/10.1016/j.neubiorev.2016.08.033

Cash, T. F., Fleming, E. C., Alindogan, J., Steadman, L., & Whitehead, A. (2002). Beyond body image as a trait: The development and validation of the Body Image States Scale. *Eating Disorders*, *10*(2), 103–113.

Dakanalis, A., Zanetti, A. M., Riva, G., Colmegna, F., Volpato, C., Madeddu, F., & Clerici, M. (2015). Male body dissatisfaction and eating disorder symptomatology: Moderating variables among men. Journal of Health Psychology, 20(1), 80–90.

Daniel, S., Bridges, S. K., & Martens, M. P. (2014). The development and validation of the Male Assessment of Self-Objectification (MASO). *Psychology of Men & Masculinity*, *15*(1), 78.

Dawson, K., Nic Gabhainn, S., & MacNeela, P. (2020). Toward a model of porn literacy: Core concepts, rationales, and approaches. *The Journal of Sex Research*, *57*(1), 1–15.

Duggan, S. J., & McCreary, D. R. (2013). Body image, eating disorders, and the drive for muscularity in gay and heterosexual men: The influence of media images. In *Eclectic Views on Gay Male Pornography* (pp. 45–58). Routledge.

Engelhardt, R., Maes, J., Way, B. M., Borgogna, N. C., & Kraus, S. W. (2025). Screening for Problematic Pornography Use with the Brief Pornography Screen: A Scoping Review (Current Addiction Reports). *Current Addiction Reports*, *12*(1), 22. https://doi.org/10.1007/s40429-025-00623-0

Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, *7*(2), 117–140.

Fredrickson, B. L., & Roberts, T.-A. (1997). Objectification theory: Toward understanding women's lived experiences and mental health risks. *Psychology of Women Quarterly*, *21*(2), 173–206.

Gewirtz-Meydan, A., Bőthe, B., & Spivak-Lavi, Z. (2024). The Associations of Pornography Use and Body Image Among Heterosexual and Sexual Minority Men. *Archives of Sexual Behavior*, 1–14.

Gewirtz-Meydan, A., & Spivak-Lavi, Z. (2023). The association between problematic pornography use and eating disorder symptoms among heterosexual and sexual minority men. *Body Image*, *45*, 284–295.

Goncalves, W. S., Gherman, B. R., Abdo, C. H. N., Coutinho, E. S. F., Nardi, A. E., & Appolinario, J. C. (2023). Prevalence of sexual dysfunction in depressive and persistent depressive disorders: A systematic review and meta-analysis. *International Journal of Impotence Research*, *35*(4), 340–349.

Griffiths, S., Mitchison, D., Murray, S. B., & Mond, J. M. (2018). Pornography use in sexual minority males: Associations with body dissatisfaction, eating disorder symptoms, thoughts about using anabolic steroids and quality of life. *Australian & New Zealand Journal of Psychiatry*, *52*(4), 339–348.

Grubbs, J. B., Kraus, S. W., & Perry, S. L. (2019). Self-reported addiction to pornography in a nationally representative sample: The roles of use habits, religiousness, and moral incongruence. *Journal of Behavioral Addictions*, *8*(1), 88–93.

Hald, G. M., & Štulhofer, A. (2016). What types of pornography do people use and do they cluster? Assessing types and categories of pornography consumption in a large-scale online sample. *The Journal of Sex Research*, *53*(7), 849–859.

Jarrar, Y., Awobamise, A. O., & Nweke, G. E. (2022). The mediating effect of social anxiety on the relationship between social media use and body dissatisfaction among university students. *Frontiers in Communication*, *7*, 900257.

Johnson, N. J. (2026). Integrating Porn Literacy Into Sex Education. In *Fundamental Concepts and Critical Developments in Sex Education* (pp. 157–166). Routledge.

Kohut, T., Balzarini, R. N., Fisher, W. A., Grubbs, J. B., Campbell, L., & Prause, N. (2020). Surveying pornography use: A shaky science resting on poor measurement foundations. *The Journal of Sex Research*, *57*(6), 722–742.

Kraus, S. W., Krueger, R. B., Briken, P., First, M. B., Stein, D. J., Kaplan, M. S., Voon, V., Abdo, C. H., Grant, J. E., & Atalla, E. (2018). Compulsive sexual behaviour disorder in the ICD-11. *World Psychiatry*, *17*(1), 109.

Kowalewska, E., Gola, M., Kraus, S. W., & Lew-Starowicz, M. (2020). Spotlight on compulsive sexual behavior disorder: A systematic review of research on women. Neuropsychiatric Disease and Treatment, 2025–2043.

Kowalewska, E., Szumska, I., & Lew-Starowicz, M. (2025). Expanding the Lens: A Systematic Review of the Latest Research on Compulsive Sexual Behavior and Problematic Pornography Use among Women. Current Addiction Reports, 12(1), 1–15.

Lewczuk, K., Wizła, M., Glica, A., Potenza, M. N., Lew-Starowicz, M., & Kraus, S. W. (2022). Withdrawal and tolerance as related to compulsive sexual behavior disorder and problematic pornography use–preregistered study based on a nationally representative sample in Poland. *Journal of Behavioral Addictions*, *11*(4), 979–993.

Lewczuk, K., Wójcik, A., & Gola, M. (2019). Increase in the prevalence of online pornography use: Objective data analysis from the period between 2004 and 2016 in Poland. *Archives of Sexual Behavior*, 1–15.

López-Pinar, C., Esparza-Reig, J., & Bőthe, B. (2025). Psychotherapy for problematic pornography use: A comprehensive meta-analysis. *Journal of Behavioral Addictions*.

Lühr, M., Pavlova, M. K., & Luhmann, M. (2022). Nonpolitical versus political participation: Longitudinal associations with mental health and social well-being in different age groups. *Social Indicators Research*, *159*(3), 865–884.

McKee, A., Albury, K., & Lumby, C. (2008). *The porn report*. Melbourne University Publishing.

Myers, T. A., & Crowther, J. H. (2009). Social comparison as a predictor of body dissatisfaction: A meta-analytic review. *Journal of Abnormal Psychology*, *118*(4), 683.

Paslakis, G., Chiclana Actis, C., & Mestre-Bach, G. (2022). Associations between pornography exposure, body image and sexual body image: A systematic review. *Journal of Health Psychology*, *27*(3), 743–760.

Pedalino, F., & Camerini, A.-L. (2022). Instagram use and body dissatisfaction: The mediating role of upward social comparison with peers and influencers among young females. *International Journal of Environmental Research and Public Health*, *19*(3), 1543.

Peter, J., & Valkenburg, P. M. (2014). Does exposure to sexually explicit Internet material increase body dissatisfaction? A longitudinal study. *Computers in Human Behavior*, *36*, 297–307.

Prause, N. (2019). Porn is for masturbation. *Archives of Sexual Behavior*, *48*(8), 2271–2277.

Quittkat, H. L., Hartmann, A. S., Düsing, R., Buhlmann, U., & Vocks, S. (2019). Body dissatisfaction, importance of appearance, and body appreciation in men and women over the lifespan. *Frontiers in Psychiatry*, *10*, 864.

Rissel, C., Richters, J., De Visser, R. O., McKee, A., Yeung, A., & Caruana, T. (2017). A profile of pornography users in Australia: Findings from the second Australian study of health and relationships. *The Journal of Sex Research*, *54*(2), 227–240.

Schaefer, L. M., & Thompson, J. K. (2018). Self-objectification and disordered eating: A meta-analysis. *International Journal of Eating Disorders*, *51*(6), 483–502. https://doi.org/10.1002/eat.22854

Smolak, L. (2006). *Body Image.*

Thompson, J. K., Heinberg, L. J., Altabe, M., & Tantleef-Dunn, S. (1999). Theory assessment, and treatment of body image disturbance. *Thomson JK, Heinberg LJ, Altabe MN, Tantlee-Dunn. Exacting Beauty: Theory, Assessment, and Treatment of Body Image Disturbance. Washington, DC: American Psychological Association*.

Thompson, J. K., Van Den Berg, P., Roehrig, M., Guarda, A. S., & Heinberg, L. J. (2004). The sociocultural attitudes towards appearance scale-3 (SATAQ-3): Development and validation. *International Journal of Eating Disorders*, *35*(3), 293–304.

Tiggemann, M., & Anderberg, I. (2020). Social media is not real: The effect of 'Instagram vs reality'images on women's social comparison and body image. New Media & Society, 22(12), 2183–2199.

Tiggemann, M., & Lynch, J. E. (2001). Body image across the life span in adult women: The role of self-objectification. *Developmental Psychology*, *37*(2), 243.

van den Brink, F., Vollmann, M., Sternheim, L. C., Berkhout, L. J., Zomerdijk, R. A., & Woertman, L. (2018). Negative body attitudes and sexual dissatisfaction in men: The mediating role of body self-consciousness during physical intimacy. *Archives of Sexual Behavior*, *47*, 693–701.

Vogels, E. A. (2018). Loving oneself: The associations among sexually explicit media, body image, and perceived realism. *The Journal of Sex Research*.

Vraga, E., Bode, L., & Troller-Renfree, S. (2016). Beyond self-reports: Using eye tracking to measure topic and style differences in attention to social media content. *Communication Methods and Measures*, *10*(2–3), 149–164.

Winter, V. R., Danforth, L. K., Landor, A., & Pevehouse-Pfeiffer, D. (2019). Toward an understanding of racial and ethnic diversity in body image among women. *Social Work Research*, *43*(2), 69–80.

Wright, P. J. (2013). US males and pornography, 1973–2010: Consumption, predictors, correlates. *Journal of Sex Research*, *50*(1), 60–71.

VI. Appendices

VI.1. Study

Curves and Pixels: Longitudinal Associations Between Frequency of Pornography Use and Body Dissatisfaction in a Sample of Hungarian Young Adults

Appendix I. 1.

Hungarian and Original English Version of The Body Attitudes Test (BAT)

	Hungarian Version Czeglédi et al., 2010)	English Version (Probst et al., 1995)
Title	Testi Attitűdök Tesztje	Body Attitudes Test, BAT
	1. Ha összehasonlítom a saját testemet a kortársaiméval, elégedetlen vagyok vele.	1. When I compare myself with my peers' bodies, I'm dissatisfied with my own.
	2. Hajlamos vagyok elrejteni a testemet	2. I'm inclined to hide my body (for example by loose clothing).
	3. Ha megnézem magam a tükörben, elégedetlen vagyok	3. When I look at myself in the mirror, I'm dissatisfied with my own body.
	4. Irigylem mások testi megjelenését.	4. I envy others for their physical appearance.
Rating Scale	0 - Soha	0 - Never
	1 - Ritkán	1 - Rarely
	2 - Néha	2 - Sometimes
	3 - Gyakran	3 - Often
	4 - Rendszerint	4 - Usually
	5 - A mindig	- Always

VI.2. Study

Bidirectional positive associations between problematic pornography use and body dissatisfaction in women and men: Findings among Hungarian young adults in a one-year longitudinal study

Appendix II. 1.

Hungarian and Original English version of the Body Attitudes Test (BAT)

	Hungarian Version (Czeglédi et al., 2010)	English Version (Probst et al., 1995)
Title	Testi Attitűdök Tesztje TAT	Body Attitudes Test, BAT
	1. Ha összehasonlítom a saját testemet a kortársaiméval, elégedetlen vagyok vele.	1. When I compare myself with my peers' bodies, I'm dissatisfied with my own.
	2. Hajlamos vagyok elrejteni a testemet	2. I'm inclined to hide my body (for example by loose clothing).
	3. Ha megnézem magam a tükörben, elégedetlen vagyok	3. When I look at myself in the mirror, I'm dissatisfied with my own body.
	4. Irigylem mások testi megjelenését.	4. I envy others for their physical appearance.
Rating Scale	0 - Soha	0 - Never
	1 - Ritkán	1 - Rarely
	2 - Néha	2 - Sometimes
	3 - Gyakran	3 - Often
	4 - Rendszerint	4 - Usually
	5 - A mindig	5 - Always

Appendix II. 2.

Hungarian And Original English Version of The Short Version of Problematic Pornography Consumption Scale (PPCS-6)

	Hungarian Version Bőthe, Tóth-Király, et al., 2021),	English Version (Bőthe, et al., 2024),
Title	Problémás Pornográfia-Használat Skála -Rövid változat (PPCS-6)	Problematic Pornography Consumption Scale Short version (PPCS-6)
	1. Úgy éreztem, a pornó az életem fontos része	1. I felt that porn is an important part of my life
	2. Úgy éreztem, egyre több pornót kell néznem, hogy kielégítsen.	2. I felt that I had to watch more and more porn for satisfaction
	3. Feszültté váltam, amikor valami gátolt a pornónézésben	3. I became stressed when something prevented me from watching porn.
	4. Amikor megfogadtam, hogy nem nézek több pornót, akkor csak rövid ideig tudtam ezt betartani.	4. When I vowed not to watch porn anymore, I could only do it for a short period of time.
	5. Pornónézéssel vezettem le a feszültségem.	5. I released my tension by watching porn.
	6. A pornó miatt elhanyagoltam más szabadidős tevékenységeket.	6. I neglected other leisure activities as a result of watching porn.
Rating Scale	1 - Soha 2 - Ritkán 3 - Inkább ritkán 4 - Előfordul 5 - Inkább gyakran 6 - Gyakran 7 - Nagyon gyakran	1 - Never 2 - Rarely 3 - Occasionally 4 - Sometimes 5 - Often 6 – Very often 7 – All the time

VI.3. Study

A Longitudinal Examination of the Mediating Role of Body Dissatisfaction in the Relationship Between Pornography Use Frequency and Eating Disturbances: A Cross-Lagged Mediation Model

Appendix III. 1.

Hungarian and Original English version of the Body Attitudes Test (BAT)

	Hungarian Version (Czeglédi et al., 2010)	English Version (Probst et al., 1995)
Title	Testi Attitűdök Tesztje TAT	Body Attitudes Test, BAT
	1. Ha összehasonlítom a saját testemet a kortársaiméval, elégedetlen vagyok vele.	1. When I compare myself with my peers' bodies, I'm dissatisfied with my own.
	2. Hajlamos vagyok elrejteni a testemet	2. I'm inclined to hide my body (for example by loose clothing).
	3. Ha megnézem magam a tükörben, elégedetlen vagyok	3. When I look at myself in the mirror, I'm dissatisfied with my own body.
	4. Irigylem mások testi megjelenését.	4. I envy others for their physical appearance.
Rating Scale	0 - Soha	0 - Never
	1 - Ritkán	1 - Rarely
	2 - Néha	2 - Sometimes
	3 - Gyakran	3 - Often
	4 - Rendszerint	4 - Usually
	5 - A mindig	5 - Always

Appendix III. 2.
Hungarian And Original English Version of the Eating Disorder Screening Questions (SCOFF)

	Hungarian Version (Czeglédi & Szabo (2016)	English Version (Coffino & Hormes (2018)
Title	SCOFF	SCOFF
	1. Kihányod magad, mert kellemetlenül tele érzed a gyomrodat?	1. Do you make yourself Sick because you feel uncomfortably full?
	2. Aggódsz amiatt, hogy elvesztetted az irányítást az evésed felett?	2. Do you worry you have lost Control over how much you eat?
	3. Az utóbbi három hónapban több mint egy követ (6,35 kg-ot) fogytál?	3. Have you recently lost more than One stone (6.35 kg) in a three-month period?
	4. Kövérnek tartod magad, amikor mások azt mondják, hogy túl sovány vagy?	4. Do you believe yourself to be Fat when others say you are too thin?
	5.Azt mondanád, hogy az étel uralja az életedet?	5. Would you say Food dominates your life?
Rating Scale	Igen	Yes
	Nem	No