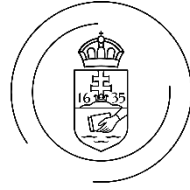EÖTVÖS LORÁND UNIVERSITY

FACULTY OF EDUCATION AND PSYCHOLOGY

EÖTVÖS LORÁND
UNIVERSITY | BUDAPEST

Theses of the Doctoral Dissertation

Mónika Koós

PREDICTORS AND CONSEQUENCES OF COMPULSIVE SEXUAL BEHAVIOR DISORDER - RESULTS FROM CROSS-CULTURAL AND LONGITUDINAL STUDIES

DOI number: 10.15476/ELTE.2023.073

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

Clinical Psychology and Addiction Program
Head of the Program: **Zsolt Demetrovics**, PhD, DSc, professor, University of Gibraltar; Eötvös Loránd University

Supervisors:
Zsolt Demetrovics, DSc, professor, University of Gibraltar; Eötvös Loránd University
Beáta Bőthe, PhD, assistant professor, Université de Montréal

Budapest, 2023

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I. Introduction

1. Definition and Diagnostic Criteria of CSBD

Compulsive sexual behavior (CSB) took a long journey to arrive where it is now, an independent category in the 11th edition of the *International Classification of Diseases* (ICD-11), listed under the category of impulse-control disorders, next to Pyromania, Kleptomania, and Intermittent Explosive Disorder (World Health Organization, 2022). Before that, there was an attempt to include Hypersexual Disorder (HD) (Kafka, 2010) under behavioral addictions, but it was declined, for the lack of comprehensive scientific studies. By definition, CSBD (World Health Organization, 2022) is characterized by reoccurring and intense sexual thoughts, urges, and - due to diminished control over them – sexual behaviors. Sexuality becomes a central focus of one's life, resulting in neglected personal life, relationships, responsibilities, health, and other important areas of functioning. There is a pattern of failed attempts to try to control or reduce these behaviors, and little or no satisfaction is gained from them anymore. These patterns of thoughts, urges, and behaviors continue for an extended period of time (over 6 months), and cause significant distress to the person, experiencing several negative consequences of them (e.g., impairment in personal, social, educational, occupational or other areas of functioning). The criteria defining it is largely overlapping with Kafka's proposal, initially with two main differences: the criteria that sexual behavior occurs as a response to dysphoric mood states, like anxiety, depression or boredom was only listed in the HD diagnosis, while the lack of pleasure gained from the behavior appeared only in the CSBD diagnosis (Gola et al., 2020). Because CSBD is listed under the impulse-control disorders, one would assume that this classification would put the emphasis on the overall diminished control individuals feel over their sexual behavior, and the decisions made acting on an impulsive urge. Yet in the diagnostic description, compulsive features are highlighted (e.g., repetitive acts, continuity despite gaining little or no satisfaction from it). Furthermore, intrusive impulses are not characteristics exclusively to impulse-control disorders, but to addictive or compulsive behaviors too (Kraus et al., 2016). Not to mention, that CSBD clearly has a negative impact on one's sexual wellbeing and sexual health (e.g., difficulties to maintain emotionally and physically healthy and satisfactory sexual relationships), therefore listing it under the "Conditions related to sexual health' chapter of ICD-11 would have been another, reasonable option (Glica et al., 2023; Lew-Starowicz & Coleman, 2022). As we can observe, several

contradictions are present in the denomination, classification, and diagnostic features of CSBD (Beáta Bőthe et al., 2022; Gola et al., 2020; Sassover & Weinstein, 2020).

2. Epidemiology

Due to the differences in the conceptualization and assessment of CSBD, it is challenging to estimate the prevalence of CSBD. Nationally representative studies are even rarer, only a handful fulfilled this criterion. A study conducted in the USA found that 10.3% of the men and 7% of the women reported difficulties with controlling their sexual urges and behaviors, resulting in clinically significant levels of distress and impairment on different areas of functioning a (Dickenson et al., 2018). In Germany, 4.9% of men and 3% of women reached the cut-off criteria of the ICD-11 diagnosis (Briken et al., 2022). In a representative study in Hungary, 7% of men, and 5.5% of women were classified to have high-risk for CSBD, based on the results from a scale developed in accordance with the ICD-11 diagnostic guidelines (Bőthe et al., 2020). Lastly, according to the newest representative study conducted in Poland, 6.25% of men and 3.17% of women reached eligibility for CSBD (Lewczuk et al., 2022). These results should be interpreted with caution however, since all of them were conducted in western, developed countries, where economic and cultural similarities are undeniable. The critique of mainly focusing on WEIRD samples (i.e., Western, Educated, Industrialized, Rich and Democratic) often formulated against sexuality research in the past years (Bőthe et al., 2021; Klein et al., 2021).

3. Negative Consequences

Negative outcomes of CSBD are listed in the diagnostic description of the ICD-11 (World Health Organization, 2022), such as impairment in occupational, social or other important domains of functioning. Going into more detail, CSBD patients report a wide range of problems, caused by their sexual behavior. Regarding interpersonal consequences, ending romantic relationships, emotionally hurting someone close to them, losing respect of their loved ones, conflicts with their family or friends are the most frequently reported adverse consequences (Muench et al., 2007; Reid et al., 2012). However, financial problems, sacrificing goals that are important to them, even losing employment or having legal problems are not uncommon either (Koós et al., 2021; Muench et al., 2007; Reid et al., 2012). As in case of many mental disorders, individuals with CSBD often feel isolated and ashamed (Fernandez et al., 2021; Giugliano, 2006)., especially since moral judgment around sexual behavior is strong in most cultures (Grubbs, Kraus, et al., 2020). Apart from psychological problems, out-of-control sexual behavior can result in serious physiological consequences, such as in an elevated risk of STIs (Muench et al., 2007; Reid et al., 2011).

4. Gender- and sexual orientation-based differences

Despite the prevalence of CSBD is much higher in men, that is, representative studies report close to twice as high rate in men than in women (Bőthe et al., 2020; Briken et al., 2022; Dickenson et al., 2018), the core and peripherical symptoms do not seem to differ significantly between genders (Werner et al., 2018). Overall, women report lower CSBD symptom severity than men, and less frequent sexual behaviors, including pornography use (Kowalewska et al., 2020). Concerning sexual orientation, being an LGBTIQ+ (i.e., lesbian, gay, bisexual, transgender, intersex, queer/questioning, asexual and many other terms, such as non-binary and pansexual) man can be a risk factor for developing and maintaining CSBD (Bőthe et al., 2018; Langstrom & Hanson, 2006). In general, men, and more specifically, sexual minority men report higher rates of sexual behavior, masturbation, and pornography consumption, than women, and sexual minority women (Bőthe et al., 2018; Kowalewska et al., 2020). Although this would not conclude in itself, that they are more prone to developing CSBD, but based on prevalence data, twice as many men reach at-risk levels for CSBD, than women (Bőthe et al., 2020; Briken et al., 2022; Dickenson et al., 2018; Lewczuk et al., 2022).

5. Aims of the dissertation and overview of the investigation

To summarize, there are still several gaps in the scientific literature about the conceptualization, predictors, risk factors, potential negative outcomes, or course of CSBD (Gola et al., 2020; Grubbs, Hoagland, et al., 2020; Kraus et al., 2016; Sassover & Weinstein, 2020). Although there is a rapidly growing number of studies in the subject, most of them are cross-sectional, mono-cultural, conducted on small populational samples, using conceptualizations and measurement tools that do not meet the newest diagnostic criteria of CSBD (Grubbs, Hoagland, et al., 2020). Therefore, responding to recent calls from the field of CSBD research (Antons & Brand, 2021; Brand et al., 2020; Grubbs, Hoagland, et al., 2020; Kraus et al., 2016; Lew-Starowicz & Coleman, 2022), the aims of the present dissertation were to systematically examine the following questions, using diverse samples, rigorous methods, high-quality measurement tools and empirically supported theories. The first study (Study 1) was a theoretical commentary, reflecting on the inconsistency between the nomenclature, the classification, and the conceptualization of CSBD, also covering the subject of impulsivity, compulsivity, their potential role in CSBD, and the practical and clinical impact the classification might have (Gola et al., 2020; Sassover & Weinstein, 2020). In the second study (Study 2), we examined sexual motivations as potential predictors of CSBD on two large, non-clinical adult samples from Hungary and Germany. The model was conducted on four independent samples, considering gender as well (i.e., Hungarian men, Hungarian women,

German men, German women), and assessed comparability between those subsamples. Therefore, the generalizability of the model was assessed across cultures and genders. In the third study (Study 3), the potential negative consequences of CSBD were assessed in a big non-clinical adult sample. As part of the project, the Hypersexual Behavior Consequences scale (HBCS; (Reid et al., 2012) was translated and adapted into Hungarian, and its factor structure and reliability were assessed. Furthermore, measurement properties of the scale were examined via different gender and sexual orientation-based groups to ensure the reliable comparability of these groups. The last study of the present dissertation (Study 4) aimed to examine the temporal stability of CSBD in a moderately large populational sample and compare it to other out-of-control behaviors (i.e., problematic social media use, internet gaming disorder, gambling disorder and problematic pornography use) during different stages of the COVID-19 outbreak. The longitudinal design also assisted to answer the concerns regarding the potential harmful effects of the nationwide lockdowns, especially concerning addictive behaviors (Awan et al., 2021; Mestre-Bach et al., 2020; Singh et al., 2020). In sum, these four studies of the present dissertation provide an overview on the current state of CSBD, starting from theoretical concerns and insights on CSBD, through predictors and outcomes, and finally, its course over time.

II. Contradicting Classification, Nomenclature, And Diagnostic Criteria Of Compulsive Sexual Behavior Disorder And Future Directions Commentary on what should be included in the criteria for compulsive sexual behavior disorder? (Gola et al., 2020) and should compulsive sexual behavior (CSB) be considered as a behavioral addiction? A debate paper presenting the opposing view (Sassover and Weinstein, 2020)[1]

1. Aims

Building on the conclusions of the debate papers by Gola et al., 2020 and Sassover & Weinstein, 2020, in the present commentary, we (1) reflect on the contradictions between the current classification, nomenclature, and diagnostic criteria of CSBD; (2) elaborate on the potential roles impulsivity and compulsivity may play in CSBD and how these characteristics may relate

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[1] Bőthe, B**., Koós, M**., & Demetrovics, Z. (2022). Contradicting classification, nomenclature, and diagnostic criteria of Compulsive Sexual Behavior Disorder (CSBD) and future directions: Commentary to the debate: "Behavioral addictions in the ICD-11." *Journal of Behavioral Addictions*, *11*(2), 204–209. https://doi.org/10.1556/2006.2022.00030

to addictive behaviors in particular; and (3) shortly discuss how CSBD's classification may impact research and clinical practice with suggesting potential future research directions helping to address the long-standing debate on the classification and symptomatology of CSBD (Bőthe, Tóth-Király, et al., 2019; Grubbs et al., 2020; Kor et al., 2013; Kraus et al., 2016; Potenza et al., 2017; Prause et al., 2017).

2. Contradictions in the Classification, Nomenclature, and Diagnostic Criteria of CSBD in ICD-11

CSBD is currently included in the Impulse Control Disorders category in ICD-11. Therefore, the general description of Impulse Control Disorders should apply to CSBD, which includes a criterion that *"repeated failure to resist an impulse, drive, or urge to perform an act that is rewarding to the person"* should be present in these disorders, suggesting that sexuality should be rewarding for individuals with CSBD World Health Organization, 2022). However, one criterion contradicts the previously described rewarding nature of Impulse Control Disorders. Specifically, it is stated in the CSBD diagnostic criteria that individuals engage in sexual behaviors *"deriving little or no satisfaction from it"* World Health Organization, 2022). While based on the classification of CSBD, sexual behaviors should be rewarding and pleasurable for the individuals and thus be the reason for engaging in them (i.e., reward-driven, impulsive activity), the CSBD diagnostic criteria describe the opposite of it by emphasizing that pleasure and satisfaction are not the drivers of sexual behaviors in CSBD, reflecting the compulsive nature of the behavior (Fineberg et al., 2014; Gola et al., 2020; World Health Organization, 2022). This seemingly contradictory classification (i.e., *impulse* control disorder), nomenclature (*compulsive* sexual behavior disorder), and diagnostic criteria (i.e., sexual activities should be *rewarding* based on the impulse control disorders diagnostic criteria vs. sexual activities should provide little or *no satisfaction* based on the CSBD diagnostic criteria) may relate to and suggest similarities with the conceptualizations of addictive disorders (Brand et al., 2016, 2019; Fineberg et al., 2014).

3. Roles of Impulsivity and Compulsivity

Both impulsivity and compulsivity share similarities in terms of impaired control or behavioral disinhibition regarding given activities and are important features of psychiatric disorders (Fineberg et al., 2014; Stein & Hollander, 1995). However, crucial differences can be observed between impaired control in impulsivity and compulsivity and how they appear in different disorders. While impaired control is characterized by rapid and unplanned reactions to gratifying stimuli without considering potential negative consequences (i.e., reward-driven risk-taking) in the case of impulsivity, it occurs as repetitive engagement in behaviors in a

habitual manner following rigid rules to avoid adverse consequences (i.e., habit-related harm-avoidance) in compulsivity (Fineberg et al., 2014; World Health Organization, 2022). Both the reward-driven impulsive and habit-related compulsive features of impaired control might contribute to and be present in addictive disorders. The findings of previous studies suggest that impulsivity may be considered as a risk factor of addictive behaviors and pronounced at the early stages of addictions (Fineberg et al., 2014), and in the later stages, as the gratification gradually decreases, the compensatory processes and effects increase, and the engagement in the behavior or substance use becomes more rigid and habitual (Brand et al., 2016, 2019). Supporting these hypothesized processes in CSBD, findings from previous studies reported CSBD's positive associations with both impulsivity and compulsivity in treatment-seeking and community samples (Bőthe, Tóth-Király, et al., 2019; Kafka, 2015; Reid et al., 2014; Reid & Carpenter, 2009; Walton et al., 2017). Moreover, findings from a community sample of more than 9000 individuals from three countries suggest that while 2.8% of individuals might demonstrate high levels of all ICD-11 diagnostic criteria of CSBD (i.e., high-risk group), there was a second group including 4.5% of individuals (i.e., satisfied at-risk group), who reported similar levels of salience, control, relapse and negative consequences as the high-risk group, but did not show elevated levels of dissatisfaction with their sexual activities (Bőthe, Potenza, et al., 2020).

4. Conclusions

We agree with the conclusions of the two debate papers and previous work (Gola et al., 2020; Grubbs et al., 2020; Kor et al., 2013; Kraus et al., 2016; Potenza et al., 2017; Sassover & Weinstein, 2020) that no sufficient scientific evidence is available to conclude on the most adequate classification and symptomatology of CSBD. We propose potential future research directions that may contribute to key insights on the roles of impulsivity and compulsivity in CSBD, advancing the classification of CSBD.

III. Sexual Motivations Underlying Compulsive Sexual Behavior In Women And Men From Germany And Hungary[2]

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[2] **Koós, M.**, Fuss, J., Klein, V., Demetrovics, Z., & Bőthe, B. (2022). Sexual Motivations Underlying Compulsive Sexual Behavior in Women and Men from Germany and Hungary. *The Journal of Sexual Medicine*, *19*(2), 170–181. https://doi.org/10.1016/j.jsxm.2021.11.005

1. Aims

The aims of the present study to (1) explore sexual motivations underlying compulsive sexual behavior, to (2) examine if the associations between sexual motivations and CSB differ for women and men, and finally, to (3) compare models explaining CSBD along the presence or the absence of the sexual motivations in the model, and comparing them to our findings (the models were the non-pathological model of high sexual drive (Winters et al., 2010), out of control sexual behavior as a sexual health problem (Vigorito & Braun-Harvey, 2017), Hypersexual Disorder (Kafka, 2010), Sex Addiction (Walton et al., 2017), Integrated Model of CSBD Birken (Briken, 2020), Impulsive/Compulsive Sexual Behavior Coleman's (Coleman, 2011), and CSBD as in the ICD-11).

2. Materials and Methods

1. Participants and Procedure

Data were collected via online questionnaires collected in Hungary and Germany, recruiting individuals aged 18 years or older. The Hungarian sample consisted of 9,380 individuals (3,178 women, 33.9%) aged between 18 and 76 years (M_{age} = 36.11 years, SD_{age} = 12.22). The German sample consisted of 434 individuals (259 women, 60.1%) aged between 18 and 70 years (M_{age} = 27.57 years, SD_{age} = 7.73).

2. Measures

Sexual Motivations Scale (SexMS) (Gravel et al., 2016; Tóth-Király et al., 2019) is a 24-item, six-factor scale assessing sexual motivations based on the self-determination theory. The six types of sexual motivations are lying on the autonomy-control continuum, ranging from the most autonomous, to the least (i.e., intrinsic, integrated, identified, introjected, external and amotivation). All items are scored on an even-point Likert-scale (1 = "does not correspond at all", 7 = "corresponds completely"). Higher scores on each factor indicate higher levels of the given motivation.

Compulsive Sexual Behavior Disorder Scale (CSBD-19) (Bőthe, Potenza, et al., 2020) is a 19-item, five-factor (i.e., control, salience, dissatisfaction, relapse, negative consequences), scale assessing compulsive sexual behavior, in line with the ICD-11 diagnostic guidelines. Participants indicated their levels of agreement with each item using a four-point scale (1 = "totally disagree", 4 = "totally agree"). Higher scores indicate higher levels of compulsive sexual behavior, and the score 50 points or above indicate individuals at high risk of compulsive sexual behavior.

3. Statistical Analysis

SPSS 21 and Mplus 7.3. (SPSS Inc., Chicago, IL, USA; (Muthén & Muthén, 1998)was used. Structural equation modeling (SEM) was used to explore the associations between the examined variables in three steps: (1) measurement models were separately tested in the four subgroups of interest (Hungarian men, Hungarian women, German men, German women), (2) tests of measurement invariance were conducted on sexual motivations and compulsive sexual behavior, (3) the most invariant measurement models were then incorporated into a path model in which sex motivations predicted the global levels of compulsive sexual behavior (Fuss, Lemay, et al., 2019).

3. Results

The group-specific measurement models demonstrated adequate fit to the data in all subgroups (CFI and TLI > .90, RMSEA < .08). The sexual motivation measurement model and the compulsive sexual behavior measurement model was invariant up to the level of latent variances-covariances (negligible decrease in model fit: ΔCFI and ΔTLI $\leq$ .010 and ΔRMSEA $\leq$ .015). Results from the tests of predictive similarity for models are reported in Table III/1, and support the complete predictive similarity (i.e., invariant regression slopes, invariant regression intercepts, and invariant regression residuals) of these results across the four groups, suggesting no significant differences in the examined associations between German and Hungarian men and women. Therefore, following the principle of parsimony and the conventions of presenting the findings of predictive invariance testing, results are reported for the total sample.

Amotivation had the strongest positive association with compulsive sexual behavior (β = .460 [95% CI .353 to .566], p < .001), while integrated (β = .267 [95% CI .218 to .316], p < .001), introjected (β = .236 [95% CI .207 to .266], p < .001), and intrinsic (β = .229 [95% CI .097 to .361], p < .001) motivations were also positively, but weakly related to compulsive sexual behavior. However, identified (β = -.133 [95% CI -.207 to -.059], p < .001) and external (β = -.113 [95% CI -.164 to -.063], p < .001) motivations showed negative and weak associations with compulsive sexual behavior. Sexual motivations explained 14.3% of compulsive sexual behavior (Figure III/1). The present pattern of associations showed similarity with Birken's (Briken, 2020) Integrated Model for CSBD to the highest extent.

Table III/1.

Examination of the associations between the factors of the SexMS and the CSBD-19 in the multi-group predictive invariance framework

Model	χ^2 (df)	CFI	TLI	RMSEA	90% CI	Comparison	$\Delta\chi^2$ (df)	ΔCFI	ΔTLI	ΔRMSEA
1. Freely estimated associations	9442. 358* (1542)*	.977	.982	.046	.045-.047	—	—	—	—	—
2. Invariant regression slopes	9389.985 (1560)*	.977	.982	.045	.044-.046	2 vs. 1	53.055 (18)*	.000	.000	-.001
3. Invariant regression intercepts	9544.247 (1563)*	.976	.982	.046	.045-.047	3 vs. 2	469.539 (3)*	-.001	.000	+.001
4. Invariant regression residuals	9556.335 (1566)*	.976	.982	.046	.045-.047	4 vs. 3	26.751 (3)*	.000	.000	.000

Note. χ^2: Mean- and variance-adjusted weighted least-squares estimator (WLSMV) chi-square test of exact fit; 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 the RMSEA; $\Delta\chi^2$ = Mean- and variance-adjusted weighted least-squares estimator (WLSMV) (calculated with the difftest function in Mplus); Δ: Change in model fit in relation to the comparison model.

*p < .01.

Figure III/1.

Visual presentation of the associations between the factors of the Sexual Motivations Scale (SexMS) and the Compulsive Sexual Behavior Disorder Scale (CSBD-19) on the total sample
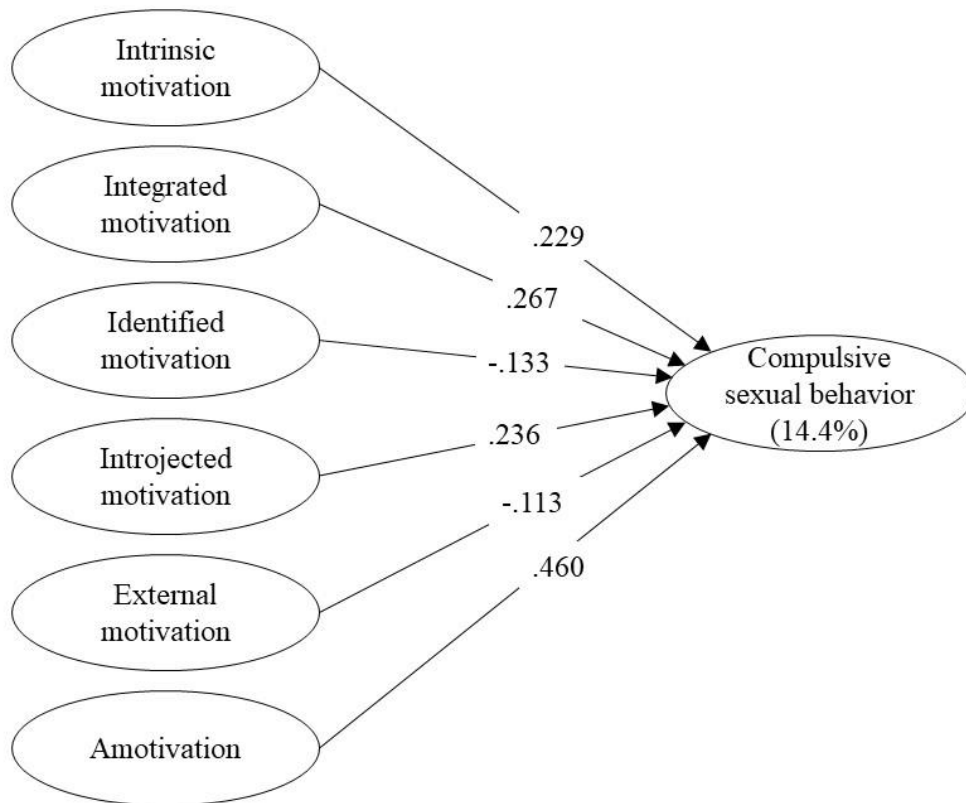
Note. All variables presented in ellipses are latent variables. For the sake of clarity, indicator variables and correlations between the predictors are not depicted in this figure. One-headed arrows represent standardized regression weights. Percentage in parentheses below the compulsive sexual behavior represents the proportion of explained variance. All pathways were significant at level $p < .001$.

4. Brief Discussion

Addressing recent calls for the integrated examination of different models of compulsive sexual behavior in diverse populations (Grubbs et al., 2020), we explored the roles of a diverse set of sexual motivations in compulsive sexual behavior, reflecting on the current theoretical conceptualizations of compulsive sexual behavior. Results indicate that higher levels of amotivation, integrated, introjected, and intrinsic motivation were related to higher levels of compulsive sexual behavior. Identified and external motivations were also weakly and

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negatively related to compulsive sexual behavior. These findings did not differ between Hungarian and German women and men. We identified the potential role of a set of sexual motivations underlying compulsive sexual behavior that resembles the conceptualization of the Integrative Model of Compulsive Sexual Behavior (Briken, 2020), namely, positive associations with amotivation, intrinsic, integrated and introjected motivations. These results contribute to the debate surrounding the conceptualization of compulsive sexual behavior as a pathological condition (Walton et al., 2017; Briken, 2020).

IV. The Negative Consequences Of Hypersexuality: Revisiting The Factor Structure Of The Hypersexual Behavior Consequences Scale And Its Correlates In A Large, Non-Clinical Sample[3]

1. Aims

The aim of the present study was to examine the validity and reliability of one of the most empirically developed and widely used scales (Hypersexual Behavior Consequence Scale; HBCS; Reid et al., 2012) in a large, non-clinical, non-English-speaking population and examine the factor structure of the scale in both women and men.

2. Materials and Methods

1. Procedure and Participants

Data were collected via an online. 16,935 completed the Hypersexual Behavior Consequence Scale questionnaire (females = 5,854; 34.6%, males = 10,981, 64.8%; other = 100, 0.6%) aged between 18 and 76 years (M = 33.6, SD = 11.1).

2. Measures

Hypersexual Behavior Consequences Scale (HBCS, Reid et al., 2012) is a 22-item scale reported to consist of one-factor, which assesses potential sequelae of hypersexual behaviors. Participants endorsed items on a five-point scale (1 = *Hasn't happened and is unlikely to happen*, 5 = *Has happened several times*).

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[3] **Koós, M.**, Bőthe, B., Orosz, G., Potenza, M. N., Reid, R. C., & Demetrovics, Z. (2021). The negative consequences of hypersexuality: Revisiting the factor structure of the Hypersexual Behavior Consequences Scale and its correlates in a large, non-clinical sample. *Addictive Behaviors Reports*, 13, 100321. https://doi.org/10.1016/j.abrep.2020.100321

Hypersexual Behavior Inventory (HBI; Reid et al., 2011) is a 19 item long questionnaire assessing CSBD symptoms via three factors (coping, control and consequences). Participants indicated their answers on a five-point Likert scale (1 = *Never*; 5 = *Very often*).

Sexuality-Related Questions (Bőthe et al., 2018) were asked assessing the number of sexual partners in one's lifetime (16-point scale, 1 = *0 partner*, 16 = *more than 50 partners*), the number of casual partners in one's lifetime (16-point scale, 1 = *0 partner*, 16 = *more than 50 partners*), frequency of sex with a partner in the last year (10-point scale, 1 = *never*, 10 = *6 or 7 times a week*), frequency of sex with casual partner in the last year (10-point scale, 1 = *never*, 10 = *6 or 7 times a week*), frequency of masturbation in the last year (10-point scale, 1 = *never*, 10 = *6 or 7 times a week*), and frequency of pornography consumption while masturbating (8-point scale, 1 = *never*, 8 = *always)*.
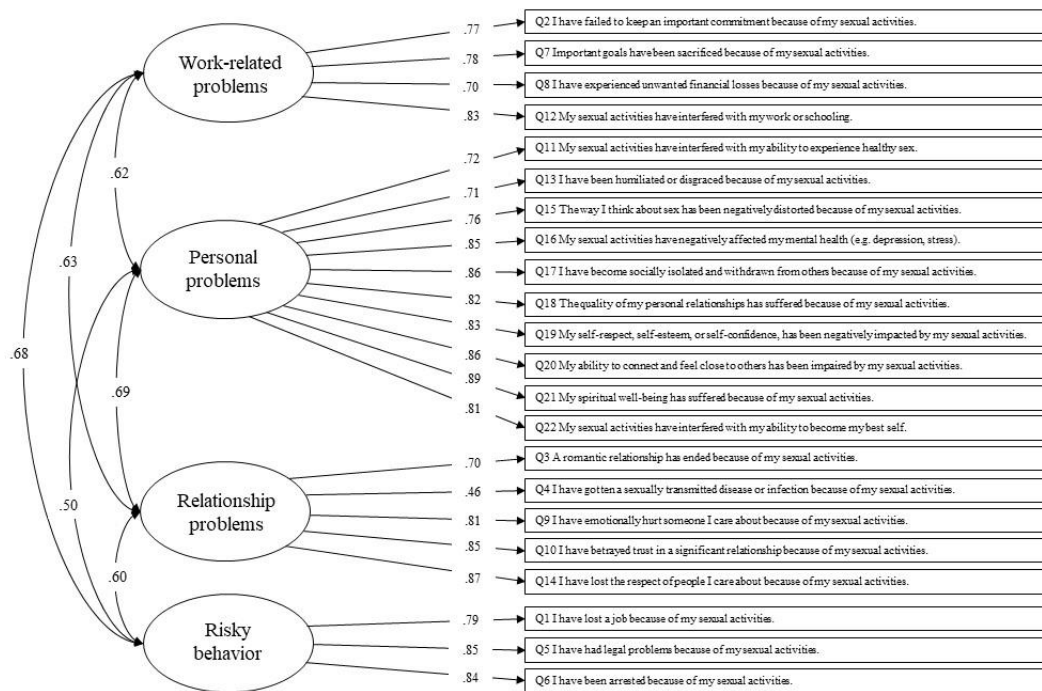
3. Statistical Analysis

IBM SPSS 21 (SPSS Inc., Chicago, IL, USA) and the Mplus6 (Muthén & Muthén, 1998) softwares were used for data analysis. After the one-factor model did not demonstrate adequate model fit on the total sample, the total sample was randomly separated into three subsamples preserving the male-female ratio. Exploratory Factor Analysis (EFA) was conducted to examine dimensions of the HBCS on the first sample, then Confirmatory Factor Analysis (CFA) was conducted to confirm the determined factors on the second sample. Measurement invariance testing was conducted regarding participants' gender, and construct validity was assessed with correlations on the third sample.

3. Results

Regarding HBCS's dimensionality, the four-factor model (see Figure IV/1) showed an acceptable fit to the data (CFI = .955, TLI = .930, RMSEA = .050, [90% CI = .048 – .051]). On the second sample, CFA was conducted, and the model showed acceptable fit to the data (CFI = 0.954, TLI = 0.948, RMSEA = 0.061 [90% CI = 0.059 – 0.062]), and the items loaded adequately on their respective factors (overall λ = 0.489 – 0.900). Furthermore, the model was invariant to the laten factor mean level. Regarding the scale's validity, the Consequence and the Control factors of the HBI were associated strongly and positively with the HBCS factors, while the Coping factor scores had a moderate and positive relationship with each.

Figure IV/1.

Confirmatory Factor Analysis and the factor structure of the HBCS

Work-related problems
- .77 → Q2 I have failed to keep an important commitment because of my sexual activities.
- .78 → Q7 Important goals have been sacrificed because of my sexual activities.
- .70 → Q8 I have experienced unwanted financial losses because of my sexual activities.
- .83 → Q12 My sexual activities have interfered with my work or schooling.

Personal problems
- .72 → Q11 My sexual activities have interfered with my ability to experience healthy sex.
- .71 → Q13 I have been humiliated or disgraced because of my sexual activities.
- .76 → Q15 The way I think about sex has been negatively distorted because of my sexual activities.
- .85 → Q16 My sexual activities have negatively affected my mental health (e.g. depression, stress).
- .86 → Q17 I have become socially isolated and withdrawn from others because of my sexual activities.
- .82 → Q18 The quality of my personal relationships has suffered because of my sexual activities.
- .83 → Q19 My self-respect, self-esteem, or self-confidence, has been negatively impacted by my sexual activities.
- .86 → Q20 My ability to connect and feel close to others has been impaired by my sexual activities.
- .89 → Q21 My spiritual well-being has suffered because of my sexual activities.
- .81 → Q22 My sexual activities have interfered with my ability to become my best self.

Relationship problems
- .70 → Q3 A romantic relationship has ended because of my sexual activities.
- .46 → Q4 I have gotten a sexually transmitted disease or infection because of my sexual activities.
- .81 → Q9 I have emotionally hurt someone I care about because of my sexual activities.
- .85 → Q10 I have betrayed trust in a significant relationship because of my sexual activities.
- .87 → Q14 I have lost the respect of people I care about because of my sexual activities.

Risky behavior
- .79 → Q1 I have lost a job because of my sexual activities.
- .85 → Q5 I have had legal problems because of my sexual activities.
- .84 → Q6 I have been arrested because of my sexual activities.

Correlations: .62, .63, .68, .69, .50, .60

Note. Standardized loadings are marked on the arrows, and significant at $p < .01$. One-headed arrows represent standardized factor loadings, two-headed represent correlations.

4. Brief Discussion

Based on the results of exploratory and confirmatory factor analyses on two independent samples, four factors relating to the negative consequences of hypersexuality emerged: Work-related problems, Personal problems, Relationship problems, and Risky behavior. These factors are similar to those previously reported (Werner et al., 2018). The HBCS is a valid and reliable scale to assess adverse outcomes related to hypersexuality. The HBCS may be used not only in large-scale survey studies but possibly also in clinical settings to assess the severity of hypersexuality and to map potential areas of impairment (Reid, Carpenter, et al., 2012). However, it is important to address that the HBCS scale is not supposed to be used to determine the presence or absence of hypersexuality or measure possible consequences of hypersexual behavioras a stand-alone assessment. It is highly suggested by the authors to use it with well-validated scales that assess hypersexuality directly (e.g., the HBI – Reid et al., 2011; the CSBD-19 – Bőthe, Potenza, et al., 2020), due to the possibility of false negative cases.

V. No Significant Changes In Addictive And Problematic Behaviors During The Covid-19 Pandemic And Related Lockdowns: A Three-Wave Longitudinal Study[4]

1. Aims

The COVID-19 outbreak and related lockdowns brought substantial changes in people's lives and led to concerns about possible increases of addictive behaviors at the initial stages of the pandemic. To examine these concerns, the aim of the present study was to assess longitudinal changes in addictive and problematic behaviors (i.e., problematic social media use, internet gaming disorder, gambling disorder, problematic pornography use, and compulsive sexual behavior disorder) over time during the COVID-19 pandemic.

2. Materials and Methods

1. Procedure and Participants

Data was collected online, in three waves (T1: May of 2020; T2: July-August of 2020; T3: January of 2021). A total of 1747 participants completed the survey at the first data collection wave, 1091 of them agreed to participate in the second wave of data collection (i.e., provided their email address during the first data collection wave and agreed to be contacted for follow-up survey), of which 656 filled out the survey during the second data collection wave, and 411 also completed the survey at the third data collection point. The gender ratio was equal at the first data collection wave (N_{males}= 882; 50.5%) and the mean age of the sample was 41.96 years ($SD = 12.52$).

2. Measures

Bergen Social Media Addiction Scale (BSMAS; (Andreassen et al., 2017; Hungarian version: Bányai et al., 2017). The six-item BSMAS was used to assess problematic social media use regarding several platforms (e.g., Facebook, Twitter). Participants indicate their answers on a five-point scale (1 = "very rarely"; 5 = "very often"). Scores are summed, and higher scores indicate higher degree of problematic social media use.

Internet Gaming Disorder Test-10 (IGDT-10; Király et al., 2019) is a 10 item scale assessing Internet Gaming Disorder in line with the DSM-5 guidelines (American Psychiatric

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[4] **Koós, M.**, Demetrovics, Z., Griffiths, M. D., & Bőthe, B. (2022). No Significant Changes in Addictive and Problematic Behaviors During the COVID-19 Pandemic and Related Lockdowns: A Three-Wave Longitudinal Study. *Frontiers in Psychology*, 13, 837315. https://doi.org/10.3389/fpsyg.2022.837315

Association, 2013). Participants indicate the frequency of the given statements on a three-point scale (0 = "never"; 1 = "sometimes"; 2 = "often").

Problem Gambling Severity Index (PGSI; Holtgraves, 2009; Hungarian version: Gyollai et al., 2013) is a nine-item scale assessing gambling behavior and related negative consequences. Participants indicate their answers on a four-point scale (0 = "*never*"; 3 = "*almost always*"). Scores are summed, and higher scores indicate a higher degree of problematic gambling.

Problematic Pornography Consumption Scale (PPCS-6; Bőthe, Vaillancourt-Morel, et al., 2021)is a six-item short scale assessing problematic pornography use based on the component model of addictions (Griffiths, 2005). Participants indicate their answers on a seven-point scale (1 = "never"; 7 = "very often). Scores are summed, and higher scores indicate higher levels of problematic pornography use.

Compulsive Sexual Behavior Disorder Scale (CSBD-19; Bőthe, Potenza, et al., 2020). See details in chapter IV.

3. Statistical Analysis

IBM SPSS 21 (SPSS Inc., Chicago, IL, USA) and the Mplus6 (Muthén & Muthén, 1998) software were used for data analysis. Attrition analysis regarding demographic variables and initial scores of the addictive behavior questionnaires were conducted to assess whether those who dropped out of the study early, differ from those who stayed in. Confirmatory factor analyses were conducted to obtain factor scores for all constructs, which were used for latent growth curve analyses to examine the change over time in the aforementioned potentially addictive behaviors, with the assumption of linear growth trajectories. The time differences between data collection waves were accounted for in the analyses, linear slopes were defined according to the months that has passed between data collection, starting from the second month, since the pandemic-related lockdowns has started two months before the first data collection. Alternative models were specified for each construct, where the linear slope factors of the second data collection time (T2) were freely estimated, considering the lifted restrictions during that time, and χ^2 difference testing was performed to compare the models (Bryant & Satorra, 2012).

3. Results

Our of all the examined variables, only gender and the initial scores of problematic social media use showed significant differences between participants who dropped out from the study and those who completed the follow-ups, but the effect sizes remained small in both cases, indicating negligible differences. In all cases, the chi-square difference tests of model fit

showed that the alternative model fits were not significantly better than the originals', therefore, the fixed models were retained for each behavior.

All LGCMs followed a linear trend and showed that the sample varied in their initial scores. However, no significant changes were observed over time in any of the examined problematic or addictive behaviors, except for compulsive behavior disorder, which demonstrated a small but significant increase.

Figure V/1.

Visual representation of the problematic behaviors over time

Problematic Behaviors Over Time
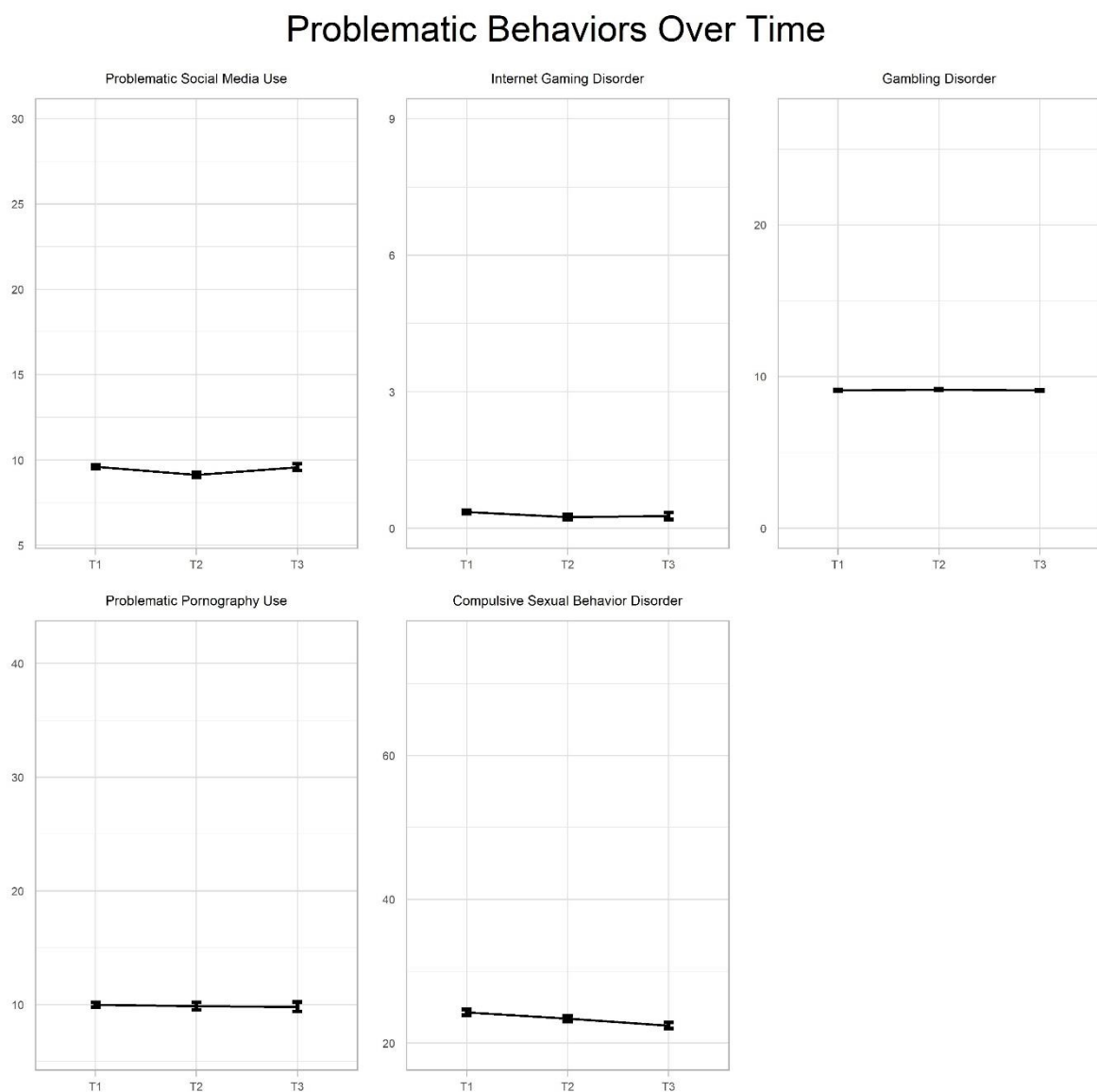
*Axis Y represents mean scores of the questionnaires, while axis X represents the three data collection time points.

Note. X-axis values should be interpreted as follows: T1 = May 2020, T2 = July-August 2020, T3 = January 2022.

4. Brief Discussion

Contrary to initial concerns (Singh et al. 2020; Király et al. 2020; Awan et al. 2021; Marchi et al. 2021; Mestre-Bach et al. 2020), no substantial changes were detected over time in problematic and potentially addictive behaviors (i.e., problematic social media use, internet gaming disorder, gambling disorder, problematic pornography use, and compulsive sexual behavior disorder) during the COVID-19 pandemic. The present results are in line with previous studies suggesting that more frequent engagement in a given activity might not be a sufficient indicator of problematic use (Bőthe, Tóth-Király, et al., 2020; Grubbs et al., 2019). In this sense, elevated frequency of use during the COVID-19 pandemic might not necessarily result in developing problematic and out-of-control behaviors.

VI. General Discussion

1. Brief summary of the main findings of the studies

Although CSBD-related research has been growing exponentially in the past decade (Grubbs, Hoagland, et al., 2020), especially since it became an official diagnosis in the ICD-11 (World Health Organization, 2022), there are several questions still unanswered regarding its conceptualization, classification, predictors, comorbidities, outcomes, course over time, and therapeutic indications (Kraus et al., 2018, 2016; Turner et al., 2022). The present dissertation examined some of these questions through a scientific lens and addressed several of the controversies and gaps by reflecting on recent advancements in the field and by investigating its predictors, outcomes and temporal stability over time.

At this point, no sufficient evidence is available to decide on which classification would be the most suitable for CSBD, since it poses justification and contradictions for impulse control, compulsivity-related, and addictive disorders as well (*Study 1*). Both the Sexual Motivations Scale (SexMS) and the Hypersexual Behavior Consequence Scale showed strong and valid psychometric properties and were invariant across genders and sexual orientations (*Studies 2 and 3*). These results suggest that both scales are reliable and valid assessment tools to measure sexual motivations underlying CSBD and its negative outcomes in a variety of populations. Furthermore, different sexual motivations related to CSBD in a certain way, which pattern was consistent throughout both genders and nationalities. Amotivation had the strongest positive association with CSBD, but integrated, introjected, and intrinsic

motivations also positively predicted it. Regarding its negative outcomes, intrapersonal problems showed the strongest, while legal problems resulted in the weakest associations with CSBD. Regarding CSBD's course over time, no significant changes were observed during the different stages of the COVID-19 related lockdowns, meaning that those who had no problem with their sexual behavior to begin with, did not develop CSBD over time, and those who had initial difficulties, did not worsen either (*Study 4*).

3. Implications of the Present Dissertation

3.1. Theoretical Implications

Since the new diagnostic criteria of CSBD has been published during the course of the present dissertation, one of the main focuses of it was to identify and partly address the contradictions in its conceptualization and gaps in the literature. The chain of evidence and results in the clinical field starts with the building blocks of conceptualization, nomenclature, assessment, the identification of predictors and outcomes, and finally, examination a disorders natural course over time. The four studies the present dissertation is based on, contributed to these foundations, starting with Study 1, stating the contradictions and future research directions. To answer these calls for clarification of Study 1, the empirical results of Study 2 contributed to a more nuanced understanding of the motivations underlying CSBD by comparing different theoretical models explaining CSBD regarding their motivational components, where the Integrated Model of Compulsive Sexual Behavior resembled this pattern the most. Furthermore, the role of compulsiveness was discussed in Study 1, then the empirical findings of Study 2 supported that either there is a distinct subgroup of individuals with CSBD that have no internal or external motivation for sexual behavior, or there is a period, probably a stage of developing CSBD, when it becomes rigid and lacks motivation. This might be explained by the *compulsiveness* in CSBD (Fineberg et al., 02/2014). Study 3 validated the Hypersexual Behavior Consequence Scale (HBCS), which measures adverse outcomes of CSBD. The study's findings provided evidence that the HBCS is a reliable tool to assess CSBD severity, but not everyone who feel out of control of their sexuality, experience these negative consequences, and not everyone who experience them, has CSBD. Finally, Study 4 made it possible to assess changes in CSBD and other problematic and addictive behaviors over the course of nine months.

3.2. Practical Implications

As for practical implications of the findings, the contribution of both Studies 1 and 2 to the discussion of CSBD's classification might assist clinical professionals in designing and developing new prevention and intervention programs to reduce risk factors associated with

CSBD, or to reduce the severity of the symptoms. The knowledge of the importance of amotivation in CSBD, and thus implied compulsion might play an important role in CSBD, interventions for compulsion might be successful in reducing CSBD symptoms. Moreover, addressing comorbidity-related research questions might have crucial clinical consequences for practitioners regarding forming appropriate diagnosis, screening for comorbidities, or specifying the best treatment options. Study 3 not only provided a valid and reliable tool to measure CSBD severity, which can not only be used in scientific research but in clinical settings as well, it also drew attention to the wide variety of adverse consequences individuals with CSBD might experience, which could guide clinicians to explore and address these questions in therapeutic settings. To conclude, adequate classification, assessment, and specification of diagnostic and transdiagnostic features of CSBD might contribute to the development of better prevention and intervention programs, policy making, and overall decisions regarding public health (Grubbs et al., 2023; Potenza, 2015).

4. Limitations and Future Directions

4.1. Limitations of the Present Dissertation

One of the main limitations of the present dissertation is the data collection methods that were used in each study, namely, using online surveys to assess clinically relevant problems in community samples, advertised on news portals. This design has several disadvantages, possibly resulting in biased data, such as social desirability or recall biases. Cross-sectional study design is limiting casual inferences greatly. Even though Study 4 had longitudinal design, but the high drop-out numbers resulted small samples sizes in the follow up data collections, and previous findings demonstrated that in longitudinal design, there is a high chance of losing those participants in the earlier stages of data collection, who might be the most vulnerable ones (Štulhofer et al., 2021). It is also important to emphasize that data collection in Study 4 had started after the pandemic and the first lock-down. Only one empirical study used a cross-cultural study design, however, it is important to highlight that Germany and Hungary are both European, white populated, developed, and industrialized countries with similar history and culture, and similar attitudes toward sexuality. Therefore, the comparison might be less meaningful as it would have been between a first world country and a non-WEIRD country (Klein et al., 2021).

4.2. Future Directions

To address some of the limitations that were listed above, research conducted on clinical samples would be critical to further understand the problem's characteristics, prognosis, and best treatment options, when it has reached clinical levels. Along with variable-centered studies,

person-centered statistical approaches would also be advised to use to provide a more comprehensive and holistic understanding of the area of interest (i.e., CSBD), because the applicability of the results are higher to the individual than in variable-centered. Longitudinal studies assessing treatment-seeking or clinical samples of CSBD patients would be recommended, to gather a more nuanced picture of the course of the disorder over time, as well as the course of its recovery. Ecological momentary assessment techniques (EMAs) are available with the development of technological devices, which could record participants' behavior and physiological measures more frequently, timed randomly and in the participants' usual environment (Moskowitz & Young, 2006).

5. Final Conclusions

To summarize, the present dissertation aimed to contribute to closing the knowledge gaps concerning conceptualization, predictors, risk factors, potential negative outcomes, or course of CSBD. The four studies of the present dissertation have attempted to contribute to the fundamentals of understanding CSBD, namely, the questions of classification, predictors, negative consequences, and its temporal course. Even though the design of the studies were ambitious, and the findings are promising, further nationally-representative, longitudinal, clinical and comprehensive studies are needed to clarify several crucial questions about CSBD, such as its prognosis, subgroups of CSBD patients, or prevention and intervention strategies.

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VII. List of Publications that the Dissertation is Based Upon

Bőthe, B**., Koós, M**., & Demetrovics, Z. (2022). Contradicting classification, nomenclature, and diagnostic criteria of Compulsive Sexual Behavior Disorder (CSBD) and future directions: Commentary to the debate: "Behavioral addictions in the ICD-11." *Journal of Behavioral Addictions*, *11*(2), 204–209. https://doi.org/10.1556/2006.2022.00030

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Total impact factor of the published studies: 17.705

Note: Each co-author has granted permission for the given publication to be included in the current dissertation.

VIII. List of Publications Directly not Used in the Dissertation

Koós, M., Demtrovics, Zs., Orosz, G., & Bőthe, B. (2022). Pesent hedonism and future time perspectives predicting hypersexuality and problematic pornography use. *Frontiers in Psychiatry,* 13, 914919. https://doi.org/10.3389/fpsyt.2022.914919

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IX. Conference Presentations and Posters

Koós, M., Bőthe B., & Demetrovics, Z. (2022) *What motivates hypersexual behavior?* Oral presentation at the 23rd Annual Fall Scientific Meeting of Sexual medicine Society of North America (SMSNA) and the 23rd International Society for Sexual Medicine (ISSM) Scientific Meeting (27-30 October, 2022)

Koós, M., Nagy, L., Demetrovics, Z., Kraus, S., Potenza, M. N., Consortium, International Sex Survey, & Bőthe, B. (2022). *Do the motivational background of pornography use frequency and problematic pornography use differ? Findings from a 45-country survey study*. Oral presentation as part of the symposia *Cross-cultural studies on compulsive sexual behaviors* at the 7th International Conference on Behavioral Addictions (ICBA) (20-22 June 2022).

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Koós, M., Bőthe, B., Nagy, L., Ünsal, B. C., & Demetrovics, Z. (2022). *A systematic review and meta-analysis of the associations between non-paraphilic compulsive sexual behavior disorder (CSBD) and comorbid psychiatric disorders.* Oral presentation at t at

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