

PARAPHILIAS

High-Frequency Pornography Use May Not Always Be Problematic



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ABSTRACT

Background: Previously, variable-centered analytic approaches showed positive, weak-to-moderate associations between frequency of pornography use (FPU) and problematic pornography use (PPU). However, person-centered studies are sparse in the literature, and these could provide insight into whether there are individuals who use pornography frequently and do not experience problems or whether there are individuals with comparable high-frequency use who differ on reported experiencing of negative consequences.

Aim: The aims of the present study were (i) to identify profiles of pornography use based on FPU and PPU by applying a person-centered analytic approach and (ii) to examine whether the identified profiles could be distinguished based on theoretically relevant demographic and psychological constructs.

Methods: Latent profile analyses were conducted on 3 nonclinical samples recruited from general websites and a pornography site (study 1: N = 14,006; study 2: N = 483; study 3: N = 672).

Results: Results were consistent across all studies. 3 distinct pornography-use profiles emerged: nonproblematic low-frequency pornography use (68–73% of individuals), nonproblematic high-frequency pornography use (19–29% of individuals), and problematic high-frequency use (3–8% of individuals). Nonproblematic and problematic high-frequency-use groups showed differences in several constructs (ie, hypersexuality, depressive symptoms, boredom susceptibility, self-esteem, uncomfortable feelings regarding pornography, and basic psychological needs).

Clinical Translation: FPU should not be considered as a sufficient or reliable indicator of PPU because the number of people with nonproblematic high-frequency use was 3–6 times higher than that with problematic high-frequency use. These results suggest that individuals with PPU use pornography frequently; however, FPU may not always be problematic.

Strengths & Limitations: Self-report cross-sectional methods have possible biases that should be considered when interpreting findings (eg, underreporting or overreporting). However, the present research included 3 studies and involved large community samples and visitors of a pornography website. The present study is the first that empirically investigated pornography-use profiles with a wide range of correlates using both severity of PPU and FPU as profile indicators on specific and general samples.

Conclusion: The present study is a first step in the differentiated examination of pornography-use profiles, taking into consideration both PPU and FPU, and it provides a foundation for further clinical and large-scale studies. Different psychological mechanisms may underlie the development and maintenance of FPU with or without PPU, suggesting different treatment approaches. Therefore, the present results may guide clinical work when considering reasons for seeking treatment for PPU. **Bóthe B, Tóth-Király I, Potenza MN, et al. High-Frequency Pornography Use May Not Always Be Problematic. J Sex Med 2020;17:793–811.**

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Key Words: Basic Psychological Needs; Comorbidity; Personality; Pornography Use Frequency; Problematic Pornography Use; Well-Being

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INTRODUCTION

Although debated^{1,2} and its systematic clinical and scientific examination has occurred recently,^{3–5} sexual addiction is a concept suggested throughout history with early descriptions of clinical patients. Multiple terms have been used to describe this phenomenon (hypersexuality, compulsive sexual behavior disorder [CSBD]), with similar but not completely overlapping definitions.^{5–8} Less than a decade ago, hypersexual disorder was being considered as a new clinical diagnosis in the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders*,^{9–11} but it was rejected. However, given additional empirical studies and clinical investigations,^{12–15} CSBD is now included in the eleventh edition of *International Statistical Classification of Diseases* and classified as an impulse-control disorder.¹⁶ Official diagnostic criteria for CSBD should promote research and clinical efforts; however, there exist important questions that currently remain, particularly with respect to problematic pornography use (PPU). Although some differences between CSBD broadly and PPU may exist,¹⁷ more than 80% of individuals with CSBD may experience PPU.^{10,15,18} Thus, PPU currently represents a prevalent, clinically relevant manifestation of CSBD; therefore, the present study focused on PPU.

How Much Is Too Much? Quantity/Frequency and Problematic Use

When examining problematic behaviors that may derive from natural human drives or needs (eg, sexuality), it may be difficult to precisely segregate “normal” and “problematic” behaviors. The quantity or frequency of the behavior in which individuals engage in the given behavior could be a potential indicator of problems.^{19,20} However, individuals’ sexual drives and desires may vary substantially, and this variability may be considered normal if the behavior does not cause impairment or functional problems for individuals.^{10,21} In previous studies using variable-centered statistical approaches, PPU and frequency of pornography use (FPU) showed positive, but only small-to-moderate, associations, indicating that these 2 aspects of pornography use are related but may be distinct domains of pornography use with different antecedents and consequences.^{22–24} There may be individuals who use pornography frequently and report no related problems, while there are others who use pornography just as frequently but report negative consequences (ie, nonproblematic high-frequency use [NPHFU] vs problematic high-frequency use [PHFU]). This possibility calls for the application of person-centered approaches that may provide a method for examining whether there are profiles or groups of participants with PPU who differ from one another based on FPU.

Preliminary Person-Centered Results on Pornography Use

Several studies have applied person-centered analytic approaches (eg, cluster analysis or latent profile analysis [LPA]) to identify distinct pornography-use profiles.^{22,25–27} When pornography use

in college students was examined, 2 distinct profiles were identified both in men and women based on pornography-use motivations, FPU, pornography acceptance, sexual attitudes, and religiosity.²⁵ In the case of men, permissive pornography exploration (65% of participants) and sexual communion and dabbling pornography use (35%) profiles emerged, with the most notable differences on FPU, pornography acceptance, pornography-use motivations, and sexual permissiveness. Regarding women, nonpermissive pornography abstinence (88%) and instrumental, integrated pornography use (12%) profiles emerged, with the most notable differences on FPU, pornography acceptance, and pornography-use motivations. In a separate study of pornography use in college students,²⁶ 3 distinct pornography-use profiles were identified based on FPU, pornography acceptance, pornography-use motivations, age, and religiosity: pornography abstinence (62%), auto-erotic pornography use (19%), and complex pornography use (19%). These 3 classes had different characteristics in terms of gender, relationship status, and self-esteem.

To date, only 2 studies have applied person-centered statistical approaches to community samples^{22,27} to identify pornography-use profiles with similar theoretical considerations (using PPU dimensions to extract use profiles). In the study of Vaillancourt-Morel et al,²⁷ the following 3 pornography-use profiles were extracted: recreational use (75%), highly distressed non-compulsive use (13%), and compulsive use (12%). These 3 profiles of pornography use showed significant differences regarding gender, the context of use (dyadic vs solitary), weekly pornography use, sexual compulsivity, sexual satisfaction, sexual avoidance, and sexual dysfunction. Likewise, Böthe et al²² also used a PPU model to identify pornography-use profiles based on the severity of PPU. 3 profiles emerged with different levels of PPU severity: nonproblematic use (79%), low-risk use (17%), and at-risk use (4%). These 3 profiles showed significant differences in terms of FPU, time spent using pornography per occasion, and levels of loneliness.

In sum, 2 to 3 pornography-use profiles have been identified based on different pornography-use characteristics (severity of PPU or pornography acceptance) and/or other potentially related constructs (sexual attitudes or religiosity). These profiles showed different demographic (gender) and psychological (sexual satisfaction or self-esteem) characteristics.^{22,25–27} However, previous studies have not applied person-centered analyses to identify possible pornography-use profiles by taking into consideration FPU and PPU simultaneously as profile indicators. Previous studies suggested that there could exist individuals who use pornography frequently and not experience problems.²⁴ At the same time, others who use pornography just as frequently may report experiencing negative consequences.²⁴

The Overarching Aims of the Present Investigation

In previous studies, PPU and FPU showed positive, but weak-to-moderate associations, suggesting that these 2 variables are

related but distinct.^{22–24} Moreover, FPU and PPU share potential similarities (eg, concerning loneliness, self-esteem, or relationship satisfaction); however, some constructs showed different associations with FPU and PPU (eg, sexual dysfunction, perceived stress, or life satisfaction). Therefore, the first aim of the present studies was to identify profiles of pornography use based on FPU and dimensions of PPU use, applying a person-centered analytic approach across 3 independent samples from specific and nonspecific populations. Based on previous studies, it was hypothesized that 3 profiles of pornography use would emerge.^{22,26,27} To examine whether the extracted profiles are interpretable, LPA should be complemented with meaningful profile correlates.²⁸ Therefore, the second aim was to compare the extracted profiles along theoretically relevant key variables such as demographic, socioeconomic, personality, psychiatric, well-being and illness measures, basic psychological needs, and pornography- and sexuality-related factors. We hypothesized that the groups identified by LPA would distinguish problematic- and nonproblematic-use groups. In study 1, the extracted pornography-use profiles were compared based on theoretically relevant demographic and socioeconomic information, pornography- and sexuality-related measures, personality tendencies (ie, impulsivity and compulsivity), and psychiatric disorders. In study 2, the identified profiles were compared along with further personality measures (factors of the big five model), perceived stress, and mindfulness. In study 3, the identified profiles were compared along with well-being and illness indicators (ie, self-esteem, satisfaction with life, depressive symptoms), dimensions of sensation-seeking, and basic psychological needs.

GENERAL METHODS OF THE STUDIES

Procedure

This 3-study research was conducted following the Helsinki Declaration and was approved by the institutional ethical review board of the research team's university. The samples were collected via online questionnaires, and survey completion took approximately 30 minutes. Participants were informed about the aims of the research, and informed consent was obtained before data collection. Only individuals aged 18 years or older were invited to participate. In study 1, individuals were invited to participate in January 2017 via a popular Hungarian news portal. In study 2, individuals were invited to participate in April 2018 via a public, topic-irrelevant Facebook page that has approximately 420,000 members. In study 3, individuals were invited to participate in December 2017 via a popular Hungarian pornography site.

Statistical Analyses

In each study, SPSS 21 (IBM Corp, Armonk, NY) and Mplus 7.3²⁹ were used for statistical analyses. To identify groups based on pornography use, LPA was used.³⁰ Responses to PPU and the FPU served as profile indicators. Models

including one to 10 profiles were estimated with the robust maximum likelihood estimator on each sample separately to examine the generalizability of the findings. To determine the number of latent classes, we used the Akaike Information Criterion (AIC), the bias-corrected AIC (CAIC), the Bayesian Information Criterion (BIC), the Sample-Size Adjusted BIC (SSABIC), entropy, the Lo-Mendell-Rubin Adjusted Likelihood Ratio Test (L-M-R Test), and “elbow plots.” These groups were then compared along with the theoretically relevant key variables with Wald tests (variables were standardized [mean = 0; standard deviation (SD) = 1] to make scores comparable on the different scales and questions and to make the results more easily interpretable³¹).^{*} The detailed description of the conducted statistical analyses can be seen in the online supplementary material ([Appendix A](#)). The description of the participants and measures used in each study are described in the specific Materials and Methods section of the given study.

STUDY 1: DEMOGRAPHIC AND SOCIOECONOMIC INFORMATION, PORNOGRAPHY- AND SEXUALITY-RELATED CHARACTERISTICS, PERSONALITY AND PSYCHIATRIC FEATURES OF PORNOGRAPHY-USE PROFILES

The aim of study 1 was to identify pornography-use profiles using a large, nonclinical sample, considering PPU dimensions and FPU as profile indicators. Moreover, the extracted profiles were compared on theoretically relevant demographic (ie, gender,³⁴ sexual orientation,³⁵ age,³⁶ age at onset of pornography use,³⁷ and relationship status³⁸), socioeconomic (ie, work and education status³⁹), pornography-related (ie, duration of pornography use per occasion,⁴⁰ pornography use—related uncomfortable feelings⁴¹) and sexuality-related (ie, relationship and sexual satisfaction,⁴² sexual dysfunction,⁴³ and sexual abuse⁴⁴) characteristics, psychiatric disorders (ie, adult attention deficit hyperactivity disorder [ADHD]⁴⁵), and personality tendencies (ie, impulsivity⁴⁶ and compulsivity¹⁷) to examine whether the identified profiles could be reliably distinguished. Detailed descriptions of the included variables and their associations with pornography use are included in the online supplementary material ([Appendix B](#)).

Materials and Methods

Participants

A total of 14,006 respondents (females = 4,185, 30.0%) were included in study 1. Respondents must have watched pornography at least once in the past 6 months. Participants were aged

^{*} As we are not aware of any agreed-upon criteria on which one can decide whether standardized mean differences among profiles are large or small, we interpret differences larger than ± 1 SD as very high differences, ± 0.5 to 1.0 SD as high differences, and values from -0.5 to 0.5 SD as slight differences on the basis of previous studies applying similar research methods.^{32,33}

between 18 and 76 years ($M_{\text{age}} = 33.2$ years, $SD_{\text{age}} = 10.9$); 4,005 were single (28.6%), 9,789 were in some kind of relationship (69.9%), and 212 indicated other relationship status (1.5%). Regarding sexual orientation, 12,970 respondents were identified as heterosexual (92.6%) and 1,036 as LGBTQ (7.4%). On average, participants watched pornography weekly.

Measures

Problematic pornography use. The Problematic Pornography Consumption Scale (PPCS)²² was used to assess past-six-month PPU ($\alpha = 0.94$). The scale covers 6 factors related to PPU: salience, tolerance, mood modification, withdrawal, relapse, and conflict.⁴⁷ The scale includes 18 items with 3 items per each factor. Respondents indicated answers on 7-point scales (1 = “never”; 7 = “all the time”).

Frequency of pornography use. Respondents indicated past-year frequency of online pornography use on a 10-point scale (1 = “never”, 10 = “6 or 7 times a week”).³⁵

Demographic and socioeconomic status. Standard demographic questions such as gender, age (in years), sexual orientation, and relationship status were asked. Additional questions assessed work and study status.

Additional pornography-related questions. First experience with pornography (age in years), time spent accessing pornography per session (in minutes), and the extent to which the individual felt uncomfortable when answering pornography-related questions (1 = “not at all”; 7 = “very often”) were assessed.

Sexual satisfaction. Sexual satisfaction was assessed using a single-item measure.^{40,48} Respondents indicated answers on a 5-point scale (1 = “not satisfied”; 5 = “very satisfied”).

Problems with sexual function. Sexual dysfunction was measured using the Sexual Dysfunction Scale using 4 items related to different aspects of sexual dysfunction: lack of interest in sexual activities, difficulty in becoming aroused, difficulty in achieving orgasm, and difficulty in enjoying sex^{49,50} ($\alpha = 0.56$). Respondents indicated answers on a 4-point scale (1 = “not a problem”; 4 = “much of a problem”).

Sexual abuse. The Sexual Abuse History Questionnaire⁵¹ was used to measure childhood (≤ 13 years old) and adolescent and adult (≥ 14 years old) sexual abuse history via 12 items and 2 factors: childhood sexual abuse (6 items; $\alpha = 0.63$) and adolescent and adult sexual abuse (6 items; $\alpha = 0.68$). Respondents indicated answers on 2-point scales (0 = “no”; 1 = “yes”). This scale was translated based on a previously established protocol.⁵²

Relationship satisfaction. Relationship satisfaction was assessed using a single-item measure.²² Respondents indicated answers on a 5-point scale (1 = “not satisfied”; 5 = “very satisfied”).

Hypersexuality. Hypersexuality was assessed using the Hypersexual Behavior Inventory,^{53,54} with 3 factors and 19 items: coping (7 items), control (8 items), and consequences (4 items) ($\alpha = 0.89$). Respondents indicated their level of hypersexuality on a 5-point Likert scale (1 = “never”; 5 = “very often”).

Impulsivity. The short UPPS-P Impulsive Behavior Scale^{55,56} was used to measure 5 different impulsivity domains via 20 items with 4 items on each factor: lack of premeditation ($\alpha = 0.82$), lack of perseverance ($\alpha = 0.83$), sensation-seeking ($\alpha = 0.77$), negative urgency ($\alpha = 0.83$), and positive urgency ($\alpha = 0.73$). Respondents indicated answers on a 4-point scale (1 = “I agree strongly”; 4 = “I disagree strongly”).

Compulsivity. The compulsivity subscale of the Structured Clinical Interview for DSM-IV (SCID-II)^{57,58} was used to assess compulsive behavior ($\alpha = 0.49$). Respondents indicated answers on a 2-point scale (0 = “false”; 1 = “true”).

Adult ADHD. The screening version of the ADHD Self-Report Scale^{59,60} was used to assess past-six-month ADHD features using 6 items ($\alpha = 0.65$). Respondents indicated answers on a 5-point scale (0 = “never”, 4 = “very often”).

Results and Brief Discussion

Identification of Latent Profiles Relating to Pornography Use

Descriptive data and associations between the examined variables are shown in the online supplementary material (Table S1). LPAs were performed on the dimensions of PPU and FPU to identify potential profiles of pornography use (Table S2). The AIC, CAIC, BIC, and SSABIC values continuously decreased as more latent classes were added to the models. Regarding entropy, all solutions had high accuracy. The results of the L-M-R-T Test did not suggest an unambiguous solution, presumably as a result of the large sample size; therefore, the elbow plot was examined (Figure S1, supplementary material). According to the results of the elbow plot, a 3-class solution was selected. The 3 latent classes are presented on Figure 1. The first class represented non-problematic low-frequency use (NPLFU; 68.7% of individuals), the second class represented NPHFU (23.9%), the third class represented PHFU (7.4%). This third class had higher levels of PPU than the other 2 classes; however, respondents in this class did not view pornography more frequently than those in the NPHFU class.

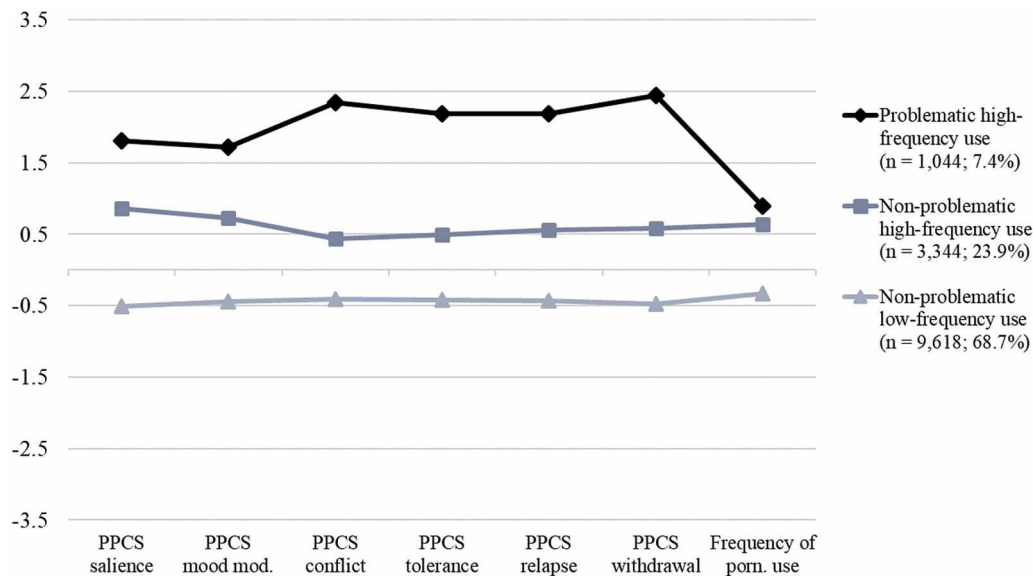


Figure 1. Latent classes based on the dimensions of the Problematic Pornography Consumption Scale (PPCS) and the frequency of pornography use (FPU) in study 1 (N = 14,006). *Note.* Scores on the subscales of the PPCS and FPU were standardized. Figure 1 is available in color online at www.jsm.jsexmed.org.

Comparison of the Pornography-Use Profiles

To examine similarities and differences between the previously identified 3 classes, demographic and socioeconomic information, pornography- and sexuality-related characteristics, personality measures, and co-occurring disorders were investigated with respect to the 3 classes (Table 1). When comparing NPLFU and NPHFU classes, the latter had score differences larger than 0.5 SD on several constructs, indicating noteworthy differences between the 2 classes. The NPHFU class was more likely to be male, and the classes were similar concerning other demographic or socioeconomic measures. The NPHFU class had higher levels of hypersexuality, but no other examined variables distinguished these 2 classes. When comparing the NPHFU and PHFU classes, the latter had score differences larger than 0.5 SD on 2 constructs indicating notable differences between these 2 classes. The PHFU class felt more uncomfortable when answering pornography-related questions, and they had higher levels of hypersexuality. However, no other differences were observed between the 2 classes.

To summarize, there were relatively few differences between NPHFU and PHFU classes, and demographic and socioeconomic measures were similar, in contrast to previous results.^{34,36,37,61} In line with previous studies,^{37,41} discomfort relating to pornography-related questions distinguished the aforementioned classes when examining pornography- and sexuality-related characteristics. Moreover, neither the dimensions of impulsivity nor compulsivity distinguished between the classes of high-frequency-use groups.¹⁷ As more than 80% of the individuals seeking treatment for hypersexuality report problems with pornography use,^{10,15,18} it was expected that hypersexuality would differentiate problematic- and nonproblematic-use classes. In contrast to previous reports,⁴⁵ the level of adult ADHD did not differentiate NPHFU and PHFU classes.

STUDY 2: PERSONALITY, PERCEIVED STRESS, MINDFULNESS, AND PORNOGRAPHY-USE PROFILES

The second study aimed to identify pornography-use profiles using a nonclinical, community sample considering PPU dimensions and FPU as profile indicators. The extracted profiles were compared on theoretically relevant personality measures (ie, big five factors,³⁶ level of perceived stress,⁶² and level of mindfulness⁶³) to examine whether the identified profiles could be reliably distinguished. Detailed descriptions of the included variables and their associations with pornography use can be seen in the online supplementary material (Appendix C).

Materials and Methods

Participants

A total of 483 respondents (females = 252, 52.2%) who watched pornography at least once in the past 6 months participated in the study. Participants were aged between 18 and 73 years ($M_{age} = 27.7$ years, $SD_{age} = 9.3$). Regarding relationship status, 171 were single (35.4%), and 292 were in a relationship (60.5%), with 20 indicating “other” relationship status (4.1%). Regarding sexual orientation, 434 respondents were heterosexual (89.9%), and 49 were LGBTQ (10.1%). On average, participants watched pornography weekly.

Measures

FPU and PPU. See study 1. The internal consistency of the PPCS was excellent ($\alpha = 0.91$).

Personality measures. Big five personality characteristics were assessed with the 15-item Big Five Inventory-2⁶⁴ with 3 items on

Table 1. Comparison of latent classes relating to pornography use on demographic, socioeconomic, pornography- and sexuality-related characteristics, personality and comorbidity variables

Category	Variable	(1) Nonproblematic low-frequency use (n = 9,618; 68.7%)	(2) Nonproblematic high-frequency use (n = 3,344; 23.9%)	(3) Problematic high-frequency use (n = 1,044; 7.4%)	Wald χ^2
Demographic and socioeconomic status	Gender ^a	0.21 ^{2,3} (0.01)	-0.43 ^{1,3} (0.01)	-0.53 ^{1,2} (0.02)	2241.51**
	Age	0.05 ^{2,3} (0.01)	-0.09 ^{1,3} (0.02)	-0.18 ^{1,2} (0.03)	97.11**
	Sexual orientation ^a	-0.03 ^{2,3} (0.01)	0.06 ^{1,3} (0.02)	0.13 ^{1,2} (0.04)	32.20**
	Relationship status ^a	0.07 ^{2,3} (0.01)	-0.12 ^{1,3} (0.02)	-0.27 ^{1,2} (0.04)	152.15**
	Studying currently ^a	-0.01 (0.01)	< -0.01 (0.02)	0.05 (0.03)	2.98
	Working currently ^a	< -0.01 (0.01)	0.01 (0.02)	-0.04 (0.03)	1.47
Pornography and sexuality-related characteristics	Age of first experience with pornography	0.09 ^{2,3} (0.01)	-0.18 ^{1,3} (0.02)	-0.30 ^{1,2} (0.03)	337.81**
	Feeling uncomfortable answering pornography-related questions	-0.13 ^{2,3} (0.01)	0.17 ^{1,3} (0.02)	0.67 ^{1,2} (0.05)	457.92**
	Duration of pornography use per occasion	-0.16 ^{2,3} (0.01)	0.23 ^{1,3} (0.02)	0.70 ^{1,2} (0.05)	596.72**
	Sexual satisfaction ^b	0.09 ^{2,3} (0.01)	-0.19 ^{1,3} (0.02)	-0.38 ^{1,2} (0.05)	208.07**
	Problems with sexual functioning ^b	-0.04 ³ (0.01)	-0.01 ³ (0.02)	0.39 ^{1,2} (0.04)	112.23**
	Childhood sexual abuse	0.02 ² (0.01)	-0.07 ^{1,3} (0.02)	0.03 ² (0.03)	18.71**
	Adolescent or adult sexual abuse	0.05 ^{2,3} (0.01)	-0.13 ^{1,3} (0.02)	-0.06 ^{1,2} (0.03)	85.06**
	Relationship satisfaction ^b	0.06 ^{2,3} (0.01)	-0.12 ^{1,3} (0.02)	-0.27 ^{1,2} (0.04)	93.77**
	UPPS sensation-seeking ^b	-0.02 ^{2,3} (0.01)	0.02 ^{1,3} (0.02)	0.06 ^{1,2} (0.03)	7.54*
	UPPS negative urgency ^b	-0.07 ^{2,3} (0.01)	0.09 ^{1,3} (0.02)	0.35 ^{1,2} (0.03)	202.82**
Personality features	UPPS positive urgency ^b	-0.07 ^{2,3} (0.01)	0.10 ^{1,3} (0.02)	0.31 ^{1,2} (0.03)	186.45**
	UPPS lack of premeditation ^b	-0.02 ^{2,3} (0.01)	0.01 ^{1,3} (0.02)	0.11 ^{1,2} (0.03)	14.55**
	UPPS lack of perseverance ^b	-0.08 ^{2,3} (0.01)	0.12 ^{1,3} (0.02)	0.32 ^{1,2} (0.04)	194.48**
	Compulsivity ^b	-0.07 ^{2,3} (0.01)	0.11 ^{1,3} (0.02)	0.31 ^{1,2} (0.04)	185.72**
	Co-occurring disorders/behaviors	Adult ADHD ^b	-0.14 ^{2,3} (0.01)	0.20 ^{1,3} (0.02)	0.65 ^{1,2} (0.03)
Hypersexuality ^b		-0.30 ^{2,3} (0.01)	0.41 ^{1,3} (0.02)	1.49 ^{1,2} (0.04)	3141.81**

ADHD = attention deficit hyperactivity disorder; SD = standard deviation.

Note. The class cells (1-3) contain the standardized mean and standard error (in parenthesis) of the corresponding variable row. Superscript numbers (1, 2, 3) indicate significant differences between the given class and the indexed classes according to the Wald χ^2 test. a = Answers were dichotomized for these questions: gender (0 = male, 1 = female), sexual orientation (0 = heterosexual, 1 = LGBTQ), relationship status (0 = single, 1 = in a relationship), study currently (0 = no, 1 = yes), work currently (0 = no, 1 = yes). b = Research reports were published based on data from these variables.^{17,35,45,53,149} However, these reports focused on distinct research questions, studied different outcome variables, had different sample sizes, and did not use person-centered statistical analysis approaches. Bold values indicate that the difference between the means of the second (nonproblematic high-frequency use) and third (problematic high-frequency use) classes are greater than 0.5 SD. * $P < .05$; ** $P < .01$.

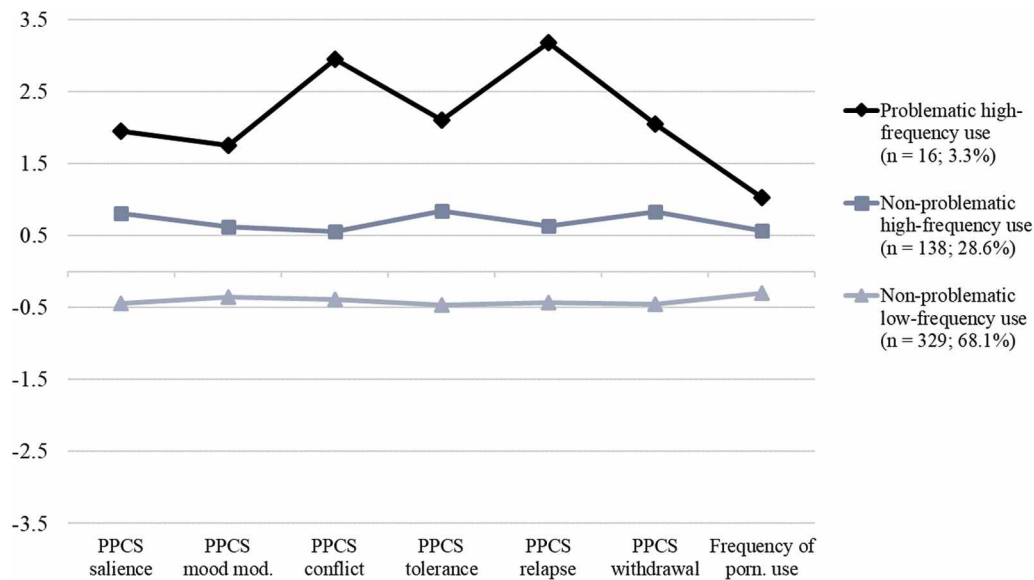


Figure 2. Latent classes based on the dimensions of the Problematic Pornography Consumption Scale (PPCS) and frequency of pornography use (FPU) in study 2 (N = 483). Note. Scores on the subscales of the PPCS and FPU were standardized. Figure 2 is available in color online at www.jsm.jsexmed.org.

each factor: agreeableness ($\alpha = 0.54$), conscientiousness ($\alpha = 0.53$), neuroticism ($\alpha = 0.69$), extraversion ($\alpha = 0.63$), and openness ($\alpha = 0.46$). Respondents indicated answers on 5-point scales (1 = “disagree strongly”; 5 = “agree strongly”). This instrument was translated using methods described previously.⁵²

Perceived stress. The extent to which different past-month life situations were appraised as stressful was measured with the 4-item version of the Perceived Stress Scale^{65,66} ($\alpha = 0.83$). Respondents indicated answers on 5-point scales (0 = “never”; 4 = “very often”).

Mindfulness. The Cognitive and Affective Mindfulness Scale-Revised⁶⁷ was assessed to measure respondents’ levels of mindfulness using 10 items ($\alpha = 0.81$). Respondents indicated answers on 4-point scales (1 = “rarely/not at all”; 4 = “almost always”). This instrument was translated using methods described previously.⁵²

Results and Brief Discussion

Identification of Latent Profiles of Pornography Use

Descriptive data and associations between examined variables are shown in the supplementary material (Table S3). LPAs were performed on the dimensions of PPU and FPU to identify potential profiles of pornography use (Table S4). The AIC, CAIC, BIC, and SSABIC values continuously decreased as more latent classes were added to the models. Regarding entropy, all solutions had high accuracy. The nonsignificant L-M-R-T Test suggested that the 4-class solution should be rejected and the 3-class solution should be retained. The 3-class solution was also supported by the results of the elbow plots (Figure S2,

supplementary material). The 3 latent classes are presented on Figure 2. The first class represented NPLFU (68.1% of individuals). The second class represented NPHFU (28.6%). The third class represented PHFU (3.3%). The third class had higher levels of PPU than the other 2 classes; however, the class did not view pornography more frequently than the NPHFU class.

Comparison of Pornography-Use Profiles

Similarities and differences between the 3 classes were examined with respect to personality measures, perceived stress, and mindfulness (Table 2). When comparing NPLFU and NPHFU classes, no notable differences (larger than 0.5 SD score differences) were shown regarding the big five personality factors, level of perceived stress, and mindfulness. When comparing NPHFU and PHFU classes, no notable differences (larger than 0.5 SD score differences) were shown regarding the big five personality factors, perceived stress, and mindfulness measures. To summarize, despite previous studies suggesting that PPU is positively related to neuroticism and perceived stress and negatively related to agreeableness, conscientiousness, and mindfulness,^{36,62,63,68,69} these personality factors and stress-related characteristics did not substantially distinguish NPHFU and PHFU classes.

STUDY 3: WELL-BEING AND ILLNESS, SENSATION-SEEKING, AND BASIC PSYCHOLOGICAL NEEDS AND PORNOGRAPHY-USE PROFILES

The third study aimed to identify pornography-use profiles using a nonclinical sample gathered from a pornography site considering PPU dimensions and FPU as profile indicators. The

Table 2. Comparison of latent classes relating to pornography use on personality factors, perceived stress, and mindfulness

Category	Variable	(1) Nonproblematic low-frequency use (n = 329; 68.1%)	(2) Nonproblematic high-frequency use (n = 138; 28.6%)	(3) Problematic high-frequency use (n = 16; 3.3%)	Wald χ^2
Big five personality factors	Openness	0.06 (0.06)	-0.09(0.09)	-0.32 (0.26)	2.90
	Conscientiousness	0.13 ^{2,3} (0.06)	-0.22 ^{1,3} (0.08)	-0.71 ^{1,2} (0.18)	25.95**
	Extraversion	0.08 ³ (0.05)	-0.12 (0.09)	-0.54 ¹ (0.26)	6.71*
	Agreeableness	0.08 ² (0.06)	-0.22 ¹ (0.09)	0.18 (0.26)	8.88*
	Neuroticism	-0.09 ^{2,3} (0.06)	0.15 ¹ (0.09)	0.42 ¹ (0.20)	8.16*
Stress-related characteristics	Perceived stress	-0.10 ^{2,3} (0.06)	0.18 ^{1,3} (0.08)	0.38 ^{1,2} (0.26)	9.93**
	Mindfulness	0.17 ^{2,3} (0.06)	-0.32 ^{1,3} (0.08)	-0.71 ^{1,2} (0.17)	36.98**

Note. The class cells (1-3) contain the standardized mean and standard error (in parenthesis) of the corresponding variable row. Superscript numbers (1, 2, 3) indicate significant differences between the given class and the indexed classes according to the Wald χ^2 test. * $P < .05$; ** $P < .01$.

extracted profiles were compared on theoretically relevant well-being and illness-related indicators (ie, satisfaction with life,⁷⁰ self-esteem,⁷¹ and depressive symptoms⁷²), subdomains of sensation-seeking (ie, adventure- and thrill-seeking, disinhibition, boredom susceptibility, and experience-seeking⁷³), and basic psychological needs (ie, autonomy, competence, and relatedness⁷⁴) to examine whether the identified profiles could be reliably distinguished (Appendix D in the online supplementary material).

Materials and Methods

Participants

A total of 672 respondents (females = 43, 6.4%) who watched pornography at least once in the past 6 months participated. Participants were aged between 18 and 75 years ($M_{\text{age}} = 39.6$ years, $SD_{\text{age}} = 9.6$). 117 were single (17.5%), 528 were in a relationship (78.5%), and 27 indicated “other” relationship status (4.0%). 606 respondents were heterosexual (90.2%), and 66 were LGBTQ (9.8%). On average, participants watched pornography 2–3 times a week.

Measures

FPU and PPU. See study 1. The internal consistency of the PPCS was excellent in this sample ($\alpha = 0.95$).

Life satisfaction. The Satisfaction With Life Scale^{75,76} assessed respondents’ general life satisfaction with 5 items ($\alpha = 0.91$). Respondents indicated answers on 7-point scales (1 = “strongly disagree”; 7 = “strongly agree”).

Self-esteem. The Rosenberg Self-Esteem Scale^{77,78} assessed respondents’ global self-esteem via 10 items ($\alpha = 0.89$). Respondents indicated answers on 4-point scales (1 = “strongly disagree”; 4 = “strongly agree”).

Depressive symptoms. Depressive symptoms were assessed with the 6-item version of the Center for Epidemiological Studies Depression Scale^{79,80} ($\alpha = 0.86$). Respondents indicated

answers on 4-point scales (1 = “rarely or none of the time”; 4 = “most or all of the time”).

Sensation-seeking. Domains of sensation-seeking were assessed with the 8-item Brief Sensation Seeking Scale^{81,82}: experience-seeking ($r = 0.37$; $P < .01$), boredom susceptibility ($r = 0.11$; $P < .01$), thrill- and adventure-seeking ($r = 0.48$, $P < .01$), and disinhibition ($r = 0.43$; $P < .01$). Respondents indicated answers on 5-point scales (0 = “strongly disagree”; 4 = “strongly agree”).

Basic psychological needs. The Basic Psychological Need Satisfaction and Frustration Scale^{83,84} assessed levels of satisfaction and frustration related to basic psychological needs via 24 items, with 4 items on each factor: relatedness satisfaction ($\alpha = 0.84$), relatedness frustration ($\alpha = 0.84$), autonomy satisfaction ($\alpha = 0.82$), autonomy frustration ($\alpha = 0.67$), competence satisfaction ($\alpha = 0.83$), and competence frustration ($\alpha = 0.85$). Respondents indicated answers on 5-point scales (1 “not true at all”; 5 = “completely true”).

Results and Brief Discussion

Latent Profiles of Pornography Use

Descriptive data and associations between examined variables are shown in the supplementary material (Table S5). LPAs were performed on dimensions of PPU and on FPU to identify potential profiles of pornography use (Table S6). The AIC, CAIC, BIC, and SSABIC values continuously decreased as more latent classes were added to the models. Regarding entropy, all solutions had high accuracy. The nonsignificant L-M-R-T Test suggested that the 4-class solution should be rejected and the 3-class solution should be retained. The 3-class solution was also supported by the results of the elbow plots (Figure S3, supplementary material). The 3 latent classes are presented in Figure 3. The first class represented NPLFU (72.8% of individuals), the second class represented NPHFU (19.0%), and the third class represented PHFU (8.2%). This third class had higher levels of PPU than the other 2 classes; however, the PHFU class did not view pornography more frequently than the NPHFU class.

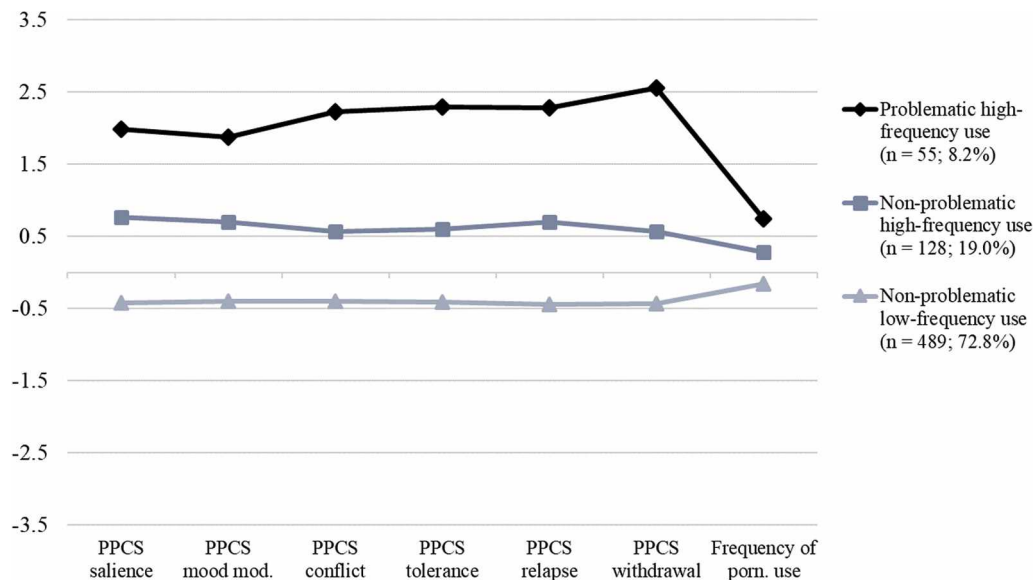


Figure 3. Latent classes based on the dimensions of the Problematic Pornography Consumption Scale (PPCS) and frequency of pornography use (FPU) in study 3 (N = 672). Note. Scores on the subscales of the PPCS and FPU were Standardized. Figure 3 is available in color online at www.jsm.jsexmed.org.

Comparison of Pornography-Use Profiles

To examine similarities and differences between the 3 classes, indicators of affective states, subdomains of sensation-seeking, and aspects of basic psychological needs were investigated (Table 3). When comparing NPLFU and NPHFU classes, the

latter had larger than 0.5 SD score differences on several constructs, indicating noteworthy differences between the 2 classes. The NPHFU class had higher levels of autonomy frustration and overall basic psychological needs frustration than the NPLFU class. When comparing NPHFU and PHFU classes, the latter

Table 3. Comparison of latent classes of pornography use on indicators of well-being and depression indicators, subdomains of sensation-seeking, and basic psychological needs

Category	Variable	(1) Nonproblematic low-frequency use (n = 489; 72.8%)	(2) Nonproblematic high-frequency use (n = 128; 19.0%)	(3) Problematic high-frequency use (n = 55; 8.2%)	Wald χ^2
Well-being and depression	Satisfaction with life	0.06 ³ (0.05)	-0.09 (0.09)	-0.33 ¹ (0.15)	6.93*
	Self-esteem	0.14 ^{2,3} (0.04)	-0.19 ^{1,3} (0.10)	-0.79 ^{1,2} (0.15)	36.88**
	Depressive symptoms	-0.18 ^{2,3} (0.04)	0.28 ^{1,3} (0.09)	0.93 ^{1,2} (0.17)	48.18**
Subdomains of sensation-seeking	Experience seeking	0.05 (0.05)	-0.10 (0.09)	-0.18 (0.12)	3.57
	Boredom susceptibility	-0.08 ³ (0.05)	0.06 ³ (0.10)	0.60 ^{1,2} (0.13)	24.33**
	Thrill and adventure seeking	<-0.01 (0.05)	-0.08 (0.09)	0.22 (0.15)	3.06
	Disinhibition	-0.06 ³ (0.06)	0.06 ³ (0.09)	0.40 ^{1,2} (0.14)	9.92**
Basic psychological needs	Relatedness satisfaction	0.11 ^{2,3} (0.05)	-0.11 ^{1,3} (0.09)	-0.68 ^{1,2} (0.15)	25.22**
	Relatedness frustration	-0.17 ^{2,3} (0.04)	0.20 ^{1,3} (0.09)	1.06 ^{1,2} (0.17)	50.33**
	Competence satisfaction	0.06 (0.05)	-0.13 (0.10)	-0.25 (0.13)	5.53
	Competence frustration	-0.18 ^{2,3} (0.04)	0.29 ^{1,3} (0.10)	0.89 ^{1,2} (0.16)	46.90**
	Autonomy satisfaction	0.09 ^{2,3} (0.05)	-0.17 ¹ (0.10)	-0.40 ¹ (0.14)	13.12**
	Autonomy frustration	-0.17 ^{2,3} (0.04)	0.33 ^{1,3} (0.09)	0.77 ^{1,2} (0.13)	53.84**
	BPN satisfaction	0.10 ^{2,3} (0.05)	-0.15 ^{1,3} (0.09)	-0.51 ^{1,2} (0.13)	19.39**
BPN frustration	-0.19 ^{2,3} (0.04)	0.31 ^{1,3} (0.09)	1.04 ^{1,2} (0.16)	64.03**	

BPN = basic psychological needs; SD = standard deviation.

Note. The class cells (1-3) contain the standardized mean and standard error (in parenthesis) of the corresponding variable row. Superscript numbers (1, 2, 3) indicate significant differences between the given class and the indexed classes according to the Wald χ^2 test. Bold values indicate that the difference between the means of the second (nonproblematic high-frequency use) and third (problematic high-frequency use) classes are greater than 0.5 SD. *P < .05; **P < .01.

had differences larger than 0.5 SD on several constructs indicating notable differences between these 2 classes. The PHFU class had higher levels of depression, boredom susceptibility, relatedness frustration, competence frustration, and overall basic psychological needs frustration and lower levels of self-esteem and relatedness satisfaction.

To summarize, in line with previous studies,^{22,62,70,71,85–87} the level of depressive symptoms, relatedness frustration and satisfaction, competence frustration, overall psychological needs frustration, and self-esteem showed notable differences between the nonproblematic and problematic high-frequency pornography-use classes. Although previous studies suggested that the experience-seeking and disinhibition dimensions of sensation-seeking could be potentially related to pornography use,^{70,88} boredom susceptibility emerged as a distinguishing characteristic between HFPU classes (problematic vs nonproblematic).

GENERAL DISCUSSION

Sexual drives are core aspects of human functioning, but the quantity and quality of sexual behaviors show high variability across individuals.^{10,89} Pornography use has become a normative behavior among adults, and individuals show differences in quantity/frequency measures of consumption. Considering the broad spectrum of “normal” sexual behaviors and the finding that the number of people with NPHFU is 3–6 times larger than the number with PHFU, pornography use may be linked to adverse health measures in a minority of adults. Although the FPU and PPU may be considered as related constructs, they are distinct.^{22–24} Therefore, the aims of the present research were (i) to identify profiles of pornography use based on FPU and PPU and (ii) to examine which demographic, socioeconomic, and personality factors; comorbid disorders; well-being and depression indicators; basic psychological needs; and pornography- and sexuality-related characteristics may potentially distinguish the classes. In 3 independent, nonclinical, specific (visitors of a pornography site) and nonspecific (community sample) samples, 3 distinct profiles were identified: NPLFU, NPHFU, and PHFU. These 3 profiles could be reliably distinguished based on certain demographic and psychological variables indicating that a different combination of specific characteristics of a given individual relates to NPHFU, while other characteristics are related to PHFU.

How Many Classes of Pornography Use Could Be Identified?

The differentiation between quantity and severity of pornography use has started to emerge in the past few years as some clinicians and researchers have observed that high FPU is not always accompanied by problematic use. On the contrary, some individuals use pornography at lower frequencies but still consider their use problematic or distressing.^{24,90} The quantity of pornography use often has weak-to-moderate positive associations

with PPU measures when applying variable-centered statistical approaches,^{22–24,90} suggesting that these 2 domains of pornography use may be considered as related but different domains. The current results are in line with these considerations, as frequency alone of pornography use did not differentiate the identified profiles reliably.

3 distinct profiles were identified in all 3 independent samples. The first profile represented NPLFU (approximately 68–73% of individuals) who did not view pornography frequently and did not experience problems related to their use. The second profile represented NPHFU (approximately 19–29% of individuals) who viewed pornography as frequently as the members of the third profile (PHFU), but members of the second profile did not report high levels of PPU. The third profile represented PHFU (approximately 3–8% of individuals) who viewed pornography as frequently as the second group, but they experienced high levels of PPU. Previous studies also extracted 3 profiles of pornography use^{22,26,27} except for one study²⁵ based on different profile indicators. Some of these studies^{25,26} used FPU, while other studies^{22,27} used PPU as profile indicators, but none of the previous studies applied both simultaneously. The present ratio of individuals in the identified profiles was similar to that of previously established profiles with PPU. Previously, approximately 75–80% of the individuals belonged to the nonproblematic/recreational use class, 15–20% to the low-risk/highly distressed noncompulsive use class, and 5–10% to the at-risk/compulsive use class.^{22,27}

In sum, 3 distinct profiles of pornography use can be identified based on FPU and PPU. These 3 profiles had different correlates in terms of demographic and socioeconomic information and psychological constructs. However, FPU in itself may not be considered as a reliable indicator of PPU. These results are consistent with recent concepts^{24,91} of different pathways of experiencing PPU. According to one model,²⁴ people may experience PPU as a result of difficulties in controlling their pornography viewing behavior, and/or people may experience pornography-related concerns relating to moral incongruence. The current findings suggest that some individuals with high-frequency use may not experience pornography use-related problems.

What Distinguishes Nonproblematic Low-Frequency From Nonproblematic High-Frequency Pornography Use?

FPU should not be considered as a sufficient indicator of problems related to pornography use. According to previous results, higher quantities of pornography use could relate to both positive and negative measures.^{92–94} Therefore, investigating possible antecedent and outcome differences relating to low-frequency and high-frequency non-PPU could be informative. The present study found few differences between NPLFU and NPHFU classes in terms of demographic and socioeconomic characteristics, with gender differing most substantially. In line

with previous studies,^{34,61} men viewed pornography more frequently than women, possibly as a result of higher sexual desire⁹⁵ or perhaps tendencies to orient externally to image-based sexuality rather than internally to interoceptive cues.⁹⁶ However, in contrast to previous results,^{23,34,36,37,39,70,97,98} LGBTQ individuals, younger individuals, single individuals, and those who had jobs or who were students currently did not use pornographic materials more than others. While the precise reasons for these apparent differences are not known, it highlights the importance of monitoring for possible changes over time in pornography-related characteristics.

As for pornography and sexuality-related characteristics, in line with previous studies,^{22,40} the frequency and duration of pornography use did associate strongly, indicating that individuals who use pornography frequently may not engage in the activity for long times per each occasion in a manner that could indicate disinhibition or diminished control over pornography use.¹⁸ Moreover, individuals belonging to the high-frequency groups did not report higher levels of uncomfortable feelings concerning their pornography use than those with NPLFU. Although relationship and sexual satisfaction reportedly had weak negative associations with FPU,^{40,42} they did not differentiate between groups low-frequency pornography use and high-frequency pornography use in the present study. Moreover, sexual dysfunction and previous sexual abuse did not differentiate between the groups low-frequency pornography use and high-frequency pornography use. The results further corroborated previous findings that FPU and sexual functioning may not associate strongly.^{99,100} Nonetheless, given reports of erectile dysfunction attributed by some men to pornography use and related support groups,^{101,102} more research is needed into individual differences (eg, tendencies or personality features) and other factors (eg, types of pornography consumed).

According to the present results, no personality features (ie, big five personality factors, compulsivity, and the aspects of impulsivity) substantially differentiated NPLFU and NPHFU groups, despite previous studies reporting that impulsivity and sensation-seeking may associate with FPU.^{46,70,73,88,103} When considering comorbid disorders, only hypersexuality distinguished NPLFU and NPHFU groups, and adult ADHD symptoms did not. These results extend those of previous studies that FPU may be a manifestation of hypersexuality.¹⁸ Regarding stress, well-being, and depression indicators, perceived stress, life satisfaction, depressive symptoms, and self-esteem had weak-to-moderate associations with the quantity of pornography use in previous studies.^{62,68,70,72,85,87,104} However, these constructs did not substantially distinguish NPLFU and NPHFU classes. Basic psychological needs related importantly to FPU. Individuals in the high-frequency class compared with the low-frequency class reported higher levels of overall basic psychological needs frustration and higher levels of autonomy frustration. Therefore,

individuals who feel being hindered in their volition may turn to pornography to reduce or alleviate negative feelings deriving from autonomy frustration as pornography viewing may provide considerable freedom of choice with a wide variety of content or permit expression through fantasy in areas that may not be readily achievable in real life.

To conclude, no demographic or socioeconomic status measures substantially differentiated NPLFU and NPHFU classes, except for gender (men were more likely to belong to the high-frequency class). Higher levels of hypersexuality, autonomy frustration, and overall basic psychological needs frustration differentiated NPLFU and NPHFU classes. Therefore, basic psychological needs frustration (especially autonomy frustration) may promote FPU in the absence of PPU, although more subtle impacts may exist.

What Distinguishes Nonproblematic High-Frequency and Problematic High-Frequency Pornography Use?

As FPU did not solely differentiate PPU and non-PPU, a question arises as to which constructs may distinguish NPHFU and PHFU classes. In the present studies, these groups did not differ on most demographic and socioeconomic measures, but certain psychological constructs differentiated the groups. Although prior studies suggested that younger single men may be at increased risk of developing PPU,^{34,36,37,61} there were no significant differences between the classes on demographic or socioeconomic characteristics. These results suggest that demographic and socioeconomic variables solely may not contribute substantially to PPU severity among those with frequent use.

Regarding pornography and sexuality-related characteristics. NPHFU and PHFU classes could not be differentiated based on the duration of their pornography use per occasion, despite previous results indicating PPU as an indicator of diminished control or disinhibition.^{18,22,37,40,41} The level of discomfort when answering pornography-related questions differentiated NPHFU and PHFU classes, resonating with previous findings that treatment-seeking individuals may report negative feelings when thinking about their pornography use and believing they may view more pornography than others.^{37,41,105} Initially, individuals may turn to pornography use to reduce or alleviate negative feelings^{22,54,71,106}; however, over time, use may result in more negative feelings that perpetuate a vicious cycle of PPU.^{10,107,108} The extent to which this process relates to religious views or moral incongruence requires further study.^{24,37,109,110} Levels of relationship or sexual satisfaction, problems with sexual functioning, and previous sexual abuse did not distinguish NPHFU and PHFU classes, although previous studies reported positive associations between PPU and the aforementioned variables.^{13,42,111–113} These differences may

relate to the precise comparisons (eg, removing individuals not using pornography or those with low use) or other factors.

Prior studies^{17,36,62} have associated decreased conscientiousness and agreeableness and increased neuroticism, impulsivity, and compulsivity with PPU. Presently, no personality factors distinguished NPHFU and PHFU classes except for boredom susceptibility. Boredom susceptibility, a subdomain of sensation-seeking, refers to the preference of unpredictable and exciting events, places, and people instead of the predictable ones.⁸² People who tend to become bored more quickly and prefer unpredictable activities may be more at risk of developing PPU among those with high-frequency use. Boredom relief and boredom reduction were identified as important motivations to use pornography^{106,114,115} as pornography use may reduce feelings of boredom.¹¹⁶ Among individuals with high levels of boredom susceptibility and high-frequency use, pornography use may become problematic as it may provide novel and varied stimuli, which could reduce boredom, although other possibilities exist (eg, relating to shifting of attention or immersion).

Regarding comorbid disorders. ADHD symptoms did not distinguish NPHFU and PHFU classes, despite previous results reporting a positive association between ADHD symptoms and PPU.⁴⁵ In line with previous studies,^{10,18,109,117} hypersexuality and depressive symptoms were implicated. The former finding is consistent with reports that more than 80% of the individuals seeking treatment for hypersexuality report problems with pornography use^{10,15,18} and hypersexuality distinguishes treatment-interested and treatment-disinterested men who view pornography.³⁸ The latter finding is consistent with criteria for hypersexuality disorder that include engaging in behaviors such as pornography viewing to escape from or cope with negative mood states.¹⁰ Regarding stress, well-being, and depression domains, measures of perceived stress, mindfulness, and satisfaction with one's life did not differentiate NPHFU and PHFU classes. Previous studies reported weak-to-moderate positive association between PPU and these variables, with life satisfaction being a potentially particularly distinguishing construct.^{62,63,68–70,85} Self-esteem in relation to PPU has received relatively little scientific attention.^{26,71} According to the present results, individuals having lower levels of self-esteem were more likely to belong to the PHFU class than to the NPHFU class. The nature of this relationship requires additional study as experiencing PPU and having feelings of poorly regulated behaviors over pornography use may result in lower levels of self-esteem through the mediating role of pornography-use-reduction self-efficacy¹¹⁸; alternatively, those with reduced self-esteem may also be drawn to engage excessively in pornography.

Notable differences were also observed between NPHFU and PHFU classes in depressive symptoms. The PHFU class reported higher levels of depressive symptoms, resonating in part with prior associations between depression measures and both FPU and PPU in previous studies.^{72,86,87,104,109} Some factors, such as

moral incongruence or religious views, have been described as potential moderators of associations of PPU and depression.⁸⁶ Among men who viewed pornography and thought about it as wrong, relatively low frequencies of pornography viewing were associated with depressive symptoms. In contrast, in the case of those men who viewed pornography and morally did not find it incongruent, only higher FPU was associated with higher levels of depressive symptoms, indicating that men having high levels of depression may use pornography as a way of coping with the negative feelings.⁸⁶ In sum, although the level of depression may potentially differentiate NPHFU and PHFU, a more detailed examination of relationships between depression and pornography use would be fruitful in future research.

Regarding basic psychological needs. relatedness satisfaction and relatedness frustration differentiated the NPHFU and PHFU classes, as did competence frustration and overall basic psychological needs frustration. In line with previous studies of PPU and basic psychological needs¹¹⁹ and research on the field of basic psychological needs,^{120–123} overall basic psychological needs frustration contribute importantly to illness and impairment. In the present study, overall basic psychological needs frustration could result in PPU accompanied by the essential role of relatedness satisfaction, relatedness frustration, and competence frustration. Individuals who feel that they cannot develop mutual meaningful social relationships because they are hindered in them may find pornography an easy way to feel connected to someone (especially in the case of feeling that they are hindered in their romantic relationships).^{22,74} This process could result in a vicious cycle of PPU in which the individual cannot develop meaningful personal relationships, thus consuming more pornographic materials, which, in turn, could result in even fewer social interactions. Furthermore, individuals who feel ineffective in their environment and feel that they are thwarted in fulfilling their capacities might turn to pornography as a tool to reduce their negative feelings and emotions deriving from competence frustration, such as in the case of depression.⁸⁶ Moreover, when comparing NPLFU and NPHFU groups, autonomy frustration differentiated these classes, while in the case of NPHFU and PHFU groups, competence and relatedness frustration differentiated the classes. Thus, patterns of basic psychological needs frustration may specifically relate to whether individuals view pornography frequently and whether they experience PPU.

To conclude, in line with previous theories,¹²⁴ no single personality feature may be responsible for the development and maintenance of PPU; instead, a combination of or an interplay between individual personality features and social and societal contexts may lead to PPU, although longitudinal studies are needed to define these relationships more precisely. Based on the present results, having high levels of hypersexuality, depression, boredom susceptibility, relatedness frustration, competence frustration, and overall basic psychological needs frustration;

having uncomfortable feelings regarding pornography; and having lower levels of self-esteem and relatedness satisfaction could represent risk factors to engage in PHFU as opposed to NPHFU.

Limitations and Future Studies

Self-report cross-sectional methods have possible biases that should be considered when interpreting findings (eg, social desirability bias), and causality cannot be inferred from cross-sectional studies. The internal consistencies of some of the scales were less than optimal, and these may have affected results. In addition, self-report measures may differ with behavioral measures of constructs,¹²⁵ and people who report higher levels of PPU may also report higher levels of other problems. Thus, it is important for future studies to investigate both behavioral and self-report measures concerning FPU and PPU (eg, tracking the actual amount of pornography use in collaboration with pornography-site operators or with longitudinal diary assessment¹⁸). However, previous findings suggest that online, anonymous data collection is likely to alleviate stress levels and could result in more honest responses when it comes to sexually-related behavior.¹²⁶ Some individuals may perceive that their pornography use as only generating minimal problems in their life, despite functional impairment (eg, decreased sleep time, decreased work productivity)¹²⁷ leading to their identification as having NPHFU instead of PHFU. Other more nuanced effects (eg, on relationship satisfaction, relationship discord, and sexual connection between partners) may not be captured by the current measures and may impact health and functioning in more subtle ways.⁹⁶ Individuals' views of the impact of pornography consumption on these and other domains of functioning may change over time, thus highlighting the need for longitudinal studies. All studies were conducted in Hungary; thus, the results may not generalize to other countries and cultures. For example, Hungary may be considered as a moderately religious country (54.6% of the Hungarian people reported being religious).¹²⁸ Thus, the ratio of PPU may be lower or higher in countries with lower or higher levels of religiosity, respectively.^{24,90}

In the present study, frustration of basic psychological needs differentiated the 3 examined profiles. In future studies, it could be fruitful to investigate the satisfaction and frustration of not only general psychological needs but also context-specific psychological needs (ie, frustration and satisfaction of needs during pornography consumption). In the context of online gaming, it was those individuals who had the highest levels of internet gaming disorder who had low need satisfaction in the real world but had high need satisfaction in gaming environments and had both high need frustration in the real-world and gaming environments.¹²⁹ Similar relationship patterns could be hypothesized regarding PPU, particularly given links between gaming and pornography viewing.^{130,131}

Recently, the examination of differences and similarities between addiction/problematic use and obsessive passion and

harmonious passion toward a given activity has emerged.^{132–139} Having an either obsessive or harmonious passion for a given activity requires frequent engagement and substantial time commitments.¹⁴⁰ However, having harmonious passion toward a given activity and spending a substantial amount of time with it may result in rather adaptive outcomes (such as self-development^{134,137} or recreational outcomes¹³⁶), while having obsessive passion toward the same activity may result in maladaptive outcomes (such as problematic use,^{134,137} compulsive behavior,^{133,138} or escapism¹³⁶). These results further corroborate that the frequency of the given activity in itself is not a sufficient and reliable indicator of problems related to the activity or addiction as it may indicate harmonious passion associated with positive measures. Nevertheless, it should be noted that obsessive passion may be considered as an antechamber of problematic use or addiction.^{134,137,141}

Person-centered statistical analyses^{22,25–27} may expand pornography-use research beyond more general variable-centered approaches. Correlates of the identified profiles in the present study may be further investigated when considering individuals' binge pornography use,¹⁸ sex motivations,^{142,143} religious and moral views,²⁴ level of sexual desire,⁸⁹ and contextual and cultural characteristics.¹²⁷ In future studies, pornography-use profiles could be determined based on not only PFU and/or PPU but also pornography-use motivations,²⁶ types of pornography used,¹⁴⁴ or binge pornography use.¹⁸ Individuals with certain pornography-use-motivation profiles (eg, using pornography to reduce or eliminate negative feelings) may have higher likelihoods of developing PPU.¹⁴⁵ The level of perceived stress did not distinguish between NPHFU and PHFU groups in the present studies, while the level of depressive symptoms did. These results suggest that it may be useful to examine stress and negative emotions separately in relation to pornography use. For example, in the case of pornography-use motivations, previous scales did not separate motivations related to the reduction of stress and negative emotions, and these motivations were labeled as “mood management”¹⁰⁶ or “emotional avoidance”⁵⁴ containing both stress-related and negative emotion-related items.

Implications

The present results have several conceptual and research implications, with several important ones discussed here. First, FPU should not be considered as a sufficient and/or reliable indicator of PPU in itself despite having a weak-to-moderate positive association with PPU.^{22–24} Second, different psychological mechanisms may underlie the development and/or maintenance of NPHFU (eg, high levels of autonomy frustration) and PHFU (eg, high levels of competence frustration, relatedness frustration, or depression). The present results may guide clinical work when considering reasons for seeking treatment for PPU.³⁷ Third, a question arises whether reducing time spent consuming pornography alone is sufficient for addressing PPU. PPU may differ from some substance-use behaviors regarding quantity/frequency

correlates of consumption, and future studies should examine further motivations and needs satisfaction related to these activities.¹²⁹ Finally, the present study suggests the value of person-centered statistical approaches for researching not only pornography use but also other behaviors with addictive potential.^{146–148}

CONCLUSIONS

The present study is the first that empirically investigates pornography-use profiles with a wide range of correlates using both severity of PPU and FPU as profile indicators in specific and general samples. 3 profiles of pornography use were identified across studies: NPLFU (68–73% of users), NPHFU (19–29% of users), and PHFU (3–8% of users). Consequently, FPU should not be considered as a sufficient indicator of PPU in itself as the number of people with NPHFU was 3–6 times higher than that with PHFU. The results suggest that individuals with PPU use pornography frequently; however, FPU may not always be problematic. Individuals with NPHFU were more likely to be male and have higher hypersexuality, autonomy frustration, and overall basic psychological needs frustration than those with NPLFU. Individuals with PHFU compared with those with NPHFU reported higher levels of not only hypersexuality and basic psychological needs frustration but also depression, boredom susceptibility, relatedness frustration, competence frustration, and discomfort when answering pornography-related questions; they also reported lower levels of self-esteem and relatedness satisfaction. Taken together, the present studies constitute an important step in examinations of pornography-use profiles taking into consideration both PPU and FPU, and the findings provide a foundation for further clinical, large-scale and longitudinal studies.

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SUPPLEMENTARY DATA

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.jsxm.2020.01.007>.