

From Curiosity to Criminality: Problematic Pornography Use, Impulsivity, and the Moderating Role of Psychopathy in Escalating from Taboo to Illegal Pornographic

Content

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Abstract

This study investigated individual factors that may explain how some individuals view illegal pornographic materials without deviant sexual interest. This pathway was characterized by escalation, defined as the act of engaging with a pornographic genre not eliciting arousal. Escalation was also measured in legal taboo genres to capture its underlying behavioral mechanism while treating illegal escalation as a risk endpoint. Problematic pornography use and impulsivity were examined as potential factors in escalation, and psychopathy as distinguishing escalation from taboo to illegal materials by moderating the relationship between problematic pornography use or impulsivity and illegal escalation. Pornography use patterns and personality traits were assessed in a community sample of adults ($N = 323$) through an online survey. Problematic pornography use predicted higher taboo escalation and unexpectedly lower illegal escalation at very high psychopathy levels. The same analyses using impulsivity showed no significant effects. However, analyses on separate UPPS-P facets revealed the negative influence of sensation-seeking on taboo escalation, further strengthened by psychopathy. The present findings challenge impulsivity-based accounts of the non-deviant pathway by suggesting that escalation may be more closely linked to dysregulated use and associated desensitization than driven by impulsive and antisocial traits. Thrill-seeking tendencies and reward sensitivity associated with impulsivity and psychopathy instead seem to limit the use of deviant content when arousal is absent. Impulsivity-related influences on escalation may require state-dependent arousal or momentary impulse rather than stable traits. The application of these findings to CSAM offending is however restricted given the absence of CSAM escalation in the sample.

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Content

In today's digital culture, mainstream pornography is widely consumed (Ballester-Arnal et al., 2023; Wéry & Billieux, 2016) for sexual fulfillment without any negative outcomes (Castro-Calvo et al., 2018; Varod et al., 2024; Wéry & Billieux, 2016).

However, users engaging with illegal content represent a significant criminal and societal issue. Such materials depict rape, bestiality, necrophilia, physical harm or life-threatening acts (Criminal Justice and Immigration 2008, §§ 63(7), 63(7A)), and child sexual abuse. Child sexual abuse materials (CSAM) qualify any material portraying a child engaged in real or simulated sexual conduct or depicting a child's sexual organs for sexual purposes (European Parliament and Council, 2011). In 2024, nearly 63 million CSAM-related files were reported to the United States National Center for Missing & Exploited Children's CyberTipline. Research has shown that 5%–15% of internet users have viewed CSAM (Muris et al., 2020; Napier et al., 2024; Seigfried-Spellar & Rogers, 2013). First exposure was accidental in half of these cases (Napier et al., 2024), and in 20% of CSAM offenders (Steely et al., 2018). Prevalence estimates for adult illegal pornography are limited but suggest that bestiality is viewed by 9%–11% of internet users (Muris et al., 2020; Seigfried-Spellar & Rogers, 2013), rape content by up to 16% (Ballester-Arnal et al., 2023; Muris et al., 2020), and that such materials are often viewed alongside CSAM (Napier et al., 2024; Seigfried-Spellar & Rogers, 2013).

Yet, not all individuals who view illegal sexual materials do so out of sexual interest in extreme content. Not all CSAM viewers have a preexisting sexual preference for children (Knack et al., 2020; Seto & Ahmed, 2014; Steely et al., 2018; Surjadi et al., 2010), and a third of CSAM offenders have viewed materials without masturbating (Surjadi et al., 2010).

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Similarly, men using zoophilic platforms report an average sexual interest in animals of 6.55/10 (de Souza Aranha e Silva & Baltieri, 2016). These findings suggest that sexual interest in extreme material is not the only predictor for its use.

For some, pornography offending could result from an escalation process. Escalation in pornography consumption is characterized by a progression toward more intense content, even when previous preferences were for less extreme material (Böthe et al., 2018; D’Orlando & Ricciotti, 2021). Thirty-two percent of students report switching to more extreme materials over time (Dwulit & Rzymiski, 2019), and 49% of male users describe searching for content they were previously not appealed by or found disgusting (Wéry & Billieux, 2016). This pattern may partly explain the meaningful prevalence of taboo/extreme content, with genres involving BDSM viewed by 16%–52% (Ballester-Arnal et al., 2023; Lawrence, 2015; Muris et al., 2020; Wéry & Billieux, 2016), and urine or feces by up to 8% (Ballester-Arnal et al., 2023; Wéry & Billieux, 2016). “Barely legal” or “teen” content is more problematic (Lawrence, 2015) yet is the fourth most viewed category among men (68%) (Wéry & Billieux, 2016), also regularly viewed by 46% of young individuals (Lawrence, 2015). Seigfried-Spellar and Rogers (2013) argued that deviant pornography use may follow a “Guttman-like progression”. They found that CSAM users also consumed other deviant (e.g., bestiality) and non-deviant materials, and that earlier exposure to adult pornography appeared to facilitate the shift from adult-only to deviant use. A third of CSAM offenders report having experienced this transition rather than initially seeking CSAM (Steely et al., 2018), also described in qualitative accounts (Rimer & Holt, 2022). This pattern suggests that escalation may be a pathway to pornography offending distinct from sexual deviance. Lanning (2001) describes these offenders as “situational”, acting out of curiosity or impulsivity, distinct from “preferential” offenders driven by a fixed sexual interest in children. Prevention and treatment of sexual deviance is therefore insufficient to prevent offending (Seto & Ahmed, 2014; Steely

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et al., 2018), and research should investigate the situational/escalating user (Seto & Ahmed, 2014; Steely et al., 2018) to identify individual differences contributing to this pathway.

Problematic Pornography Use

Escalation is seen in individuals with problematic pornography use (PPU) (Böthe et al., 2018; Hanseder & Dantas, 2023; Ince et al., 2021, 2023, 2024). PPU refers to persistent, dysregulated engagement with pornography despite attempts to quit and adverse consequences on mental health, relationships, and daily functioning (Lewczuk et al., 2022; Wéry & Billieux, 2017). Its prevalence ranges from 3.6% to 22.8% depending on assessment criteria (Böthe et al., 2018; Lewczuk et al., 2022; Varod et al., 2024; Wéry & Billieux, 2017). Individuals with PPU often use pornography with motives other than sexual fulfillment, such as emotional regulation (Böthe et al., 2021; Castro-Calvo et al., 2018; Hanseder & Dantas, 2023; Wéry & Billieux, 2016), reflecting compulsive rather than pleasure-driven use.

This aligns with the manifestation of escalation. Individuals with PPU report seeking out increasingly novel or intense genres not previously enjoyed to achieve prior arousal levels (Hanseder & Dantas, 2023; Ince et al., 2021, 2023, 2024), reflecting tolerance and desensitization (Ince et al., 2021, 2023, 2024; Lewczuk et al., 2022). Satisfaction decreases over time, driving some users to seek out extreme or potentially illegal materials (Lewczuk et al., 2022; Sharpe & Mead, 2021). PPU severity has been associated with sexual impairments, such as diminished arousal and erectile dysfunction (Varod et al., 2024; Wéry & Billieux, 2016). Some men on pornography recovery forums attribute escalation to these issues (Sharpe & Mead, 2021).

Research indeed suggests that PPU is associated with the use of materials considered paraphilic or unusual (Ballester-Arnal et al., 2023; Lewczuk et al., 2022). While some CSAM offenders report PPU prior to offending (Rimer & Holt, 2022), no quantitative evidence has confirmed a direct link between PPU and escalation to illegal pornography.

Impulsivity

While escalation in pornography use has been attributed to desensitization, it may also reflect impulsive action. Impulsivity is the tendency to act prematurely or without forethought. It includes five facets: positive and negative urgency (acting rashly under emotion), lack of premeditation (acting without considering consequences), lack of perseverance (difficulty sustaining focus on tasks), and sensation-seeking (preference for novel and intense experiences) (Cyders & Smith, 2007; Whiteside & Lynam, 2001). The situational pathway has been seen as impulsive and curious (Knack et al., 2020; Lanning, 2001; Seto & Ahmed, 2014). For instance, frequent pornography consumption was associated with CSAM use in sensation-seekers (Ray et al., 2013). Some offenders frame their behavior as impulsive to overcome boredom and triggered by emotional load (Knack et al., 2020; Rimer & Holt, 2022; Steely et al., 2018), reflecting sensation-seeking and urgency. de Souza Aranha e Silva and Baltieri (2016) found a similar pattern among zoophilic platform members using a sexual impulsiveness scale that contains items aligning with positive urgency, lack of premeditation, and sensation-seeking. Nevertheless, these studies investigate samples likely exhibiting higher levels of sexual deviance (e.g., CSAM viewers, convicts, paraphilia-specific platform users), limiting inference on impulsivity to viewing but not escalation.

Given the impulsivity–PPU association (Bocci Benucci et al., 2024) and the manifestation of genre escalation in PPU (Ince et al., 2021, 2023, 2024), impulsivity might contribute to escalation through this connection. Indeed, individuals with PPU present cognitive impairments that foster impulsive behavior, with decision-making biased toward sexual stimuli and difficulty weighing potential consequences (Castro-Calvo et al., 2021).

This convergence aligns with Knack et al. (2020) proposing that the escalation pathway arises from an interplay of sensation-seeking, habituation to previous materials, use of pornography for escapism (e.g., coping/PPU), and hyperfocused sexual arousal. CSAM

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offenders describe hyperfocused sexual arousal as state where intense sexual preoccupation overrides concern over consequences, facilitating escalation (Knack et al., 2020). The loss of deliberative control is characteristic of “visceral states” (e.g., hunger, arousal) that drive impulsive action by shifting decision-making toward short-term relief of the state (e.g., food, sexual gratification) (Loewenstein, 1996). The overlap between impulsivity and PPU calls for clarification of their respective roles in escalation by examining them independently.

Subclinical Psychopathy

Although not part of Knack et al.’s (2020) model, psychopathy may contribute to the process through its dynamics with both factors and outcomes. Psychopathy in subclinical populations is a pattern of antisociality characterized by rule-breaking and oppositional behavior, low empathy, impulsivity, and disinhibition (Paulhus & Williams, 2002). Psychopaths show high impulsivity (Malesza & Ostaszewski, 2016; Paulhus & Williams, 2002) in sensation-seeking and urgency dimensions (West et al., 2023). Psychopathy also correlates with PPU (Sindermann et al., 2018), and with overall greater pornography consumption (Muris et al., 2020). Psychopathic individuals use a wide variety of sexual materials, including those considered intense or socially inappropriate (Paul, 2009). While narcissism has the strongest association with consumption of taboo pornography (e.g., BDSM) (Muris et al., 2020), psychopathy is associated with viewing illegal materials (Muris et al., 2020; Ray et al., 2013). This suggests that psychopathy may be disinhibitory in engaging with illegal content. Reflecting this, 16% of a sample of CSAM offenders indicated that they began viewing CSAM because they felt a thrill from pushing moral and legal limits (Steely et al., 2018).

Impulsive and addictive tendencies in psychopathy reflect a preference for immediate gratification over delayed greater rewards (Malesza & Ostaszewski, 2016), which also occurs during sexual arousal (Loewenstein, 1996). When combined with disregard for consequences

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and the accessibility of illegal content online, it may facilitate escalation to illegal content.

This is consistent with evidence that individuals with greater antisocial traits are more likely to engage with unsolicited sexual content online (e.g., pop-ups) (Shim et al., 2007).

These observations overall suggest that psychopathy may be a distinguishing factor between escalation to taboo genres and escalation to illegal materials among individuals with high impulsivity or PPU. While it may come naturally for most to avoid such content when encountered accidentally, psychopaths may pursue engagement without preoccupation with the legality and harmfulness of the content. Although the moderating effect of psychopathy in the relationship between frequency of use and CSAM viewing has not been substantiated (Ray et al., 2013), this relationship may appear when considering dysregulated use or impulsive tendencies rather than frequency.

Present Study

The present research examined the extent to which individual differences in PPU and impulsivity could explain why some individuals come to view taboo or illegal pornographic content without an initial sexual interest in the material, conceptualized as escalation. This study quantitatively investigated the dynamics proposed by Knack et al. (2020), focusing on problematic pornography use and impulsivity as distinct predictors of escalation, and introduced subclinical psychopathy as a potential moderator of these relationships. Individuals with greater PPU or impulsivity were expected to be more likely to report escalation to taboo content (H1, H3). Psychopathy was hypothesized to distinguish those whose escalation extends to illegal content among these same individuals. Specifically, the association between PPU and escalation to illegal content was expected to be positive and significant only at high levels of psychopathy (H2). The same moderating effect of psychopathy was expected on the relationship between impulsivity and escalation to illegal content (H4).

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To further clarify the role of impulsivity, this study examined whether the predicted relationships with escalation and psychopathy hold across all five facets or differ between them. Given prior research, sensation-seeking and urgency dimensions might emerge as most relevant to escalation and therefore show stronger relationships (H5). This approach addresses measurement inconsistencies in research and allows for a more nuanced understanding of how specific impulsive traits may contribute to escalation.

Additionally, gender was included as a covariate given that men report higher deviant pornography use (Muris et al., 2020; Seigfried-Spellar & Rogers, 2013), PPU (Böthe et al., 2018; Lewczuk et al., 2022; Varod et al., 2024; Wéry & Billieux, 2017), and that these patterns' associations with impulsivity and antisocial traits vary by gender (Bocci Benucci et al., 2024; Muris et al., 2020). Age at first pornography use was also controlled for, as earlier exposure has been linked to qualitative escalation (Dwulit & Rzymiski, 2019; Seigfried-Spellar & Rogers, 2013).

Method

Participants

The study was uploaded on the research participation platform of Erasmus University of Rotterdam (EUR) and social media platforms such as Reddit, WhatsApp, and Instagram. Posters with a QR code to access the study were featured at universities of Rotterdam, Leiden, Utrecht, and Maastricht. EUR students could earn participation credits, but others were not rewarded. A minimum age of 18 years was required.

Out of 549 recorded responses, 226 (41.2%) participants were excluded from the study. Cases were excluded based on invalid consent ($n = 18$), unsuitable age ($n = 15$), fast completion time (i.e., under five minutes; $n = 142$), and incomplete data ($< 75\%$ valid items; $n = 51$). One participant clearly expressed intent to disturb study data in an open question field, further reflected in a pattern of redundant and extreme responding. This case was deemed to

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reflect dishonest responding and was excluded. The final sample of 323 participants included 60.4% women, 35.3% men, and 4.3% non-binary. Ages ranged from 18 to 64 years, with a mean of 24.3 years ($SD = 6.4$), and half of the participants under 22 years. Most participants were White (78.3%), around 6% were Mixed, 6.2% Asian, 3.7% Middle Eastern or North African, 2.8% Hispanic, and 2.5% Black/African American. Most resided in Europe (the Netherlands, Germany, etc.) or North America (USA, Canada). The sample mostly comprised students (58.5%), and 31.9% were employed, 4.3% unemployed, and 2.2% unable to work or retired. Educational attainment was diverse, with a majority (43.4%) holding a bachelor's degree or higher. Twenty-nine percent had high school education or less, 27.5% had postsecondary education below a bachelor's degree (college without diploma, vocational diploma, associate's degree).

Measures

This study was part of a larger project that includes various measures on personality, mental health, and pornography use. Three scales were used in this study.

Problematic Pornography Consumption Scale

PPU was measured using the Problematic Pornography Consumption Scale (PPCS) developed by Bóthe et al. (2018) assessing self-reported problematic pornography consumption based on six components: salience, mood modification, conflict, tolerance, relapse, and withdrawal. Eighteen items are rated on a seven-point Likert scale (1 = *never* to 7 = *all the time*) in reference to the past six months. Example items include, "In the past six months, I unsuccessfully tried to reduce the amount of porn I watch" and "I had to watch more porn for satisfaction". For participants with at least 15 (80%) valid items, total scores were computed using prorated scoring. Other cases were listwise deleted from PPU models. Scores range from 18 to 126, with higher scores indicating greater problematic use. A score of

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76 or higher distinguishes problematic users from non-problematic users. The PPCS demonstrated excellent internal consistency in the sample ($\alpha = .94$).

Short UPPS-P Impulsive Behavior Scale

The Short UPPS-P Impulsive Behavior Scale (SUPPS-P) measures self-reported trait impulsivity through five facets: negative urgency (e.g., “When I feel bad, I will often do things I later regret in order to make myself feel better now”), lack of perseverance (e.g., “I finish what I start”), lack of premeditation (e.g., “I like to stop and think things over before I do them”), sensation-seeking (e.g., “I welcome new and exciting experiences and sensations, even if they are a little frightening and unconventional”), and positive urgency (e.g., “I tend to lose control when I am in a great mood”) (Cyders et al., 2014; Lynam, 2013). Twenty items rated on a four-point Likert scale (1 = *strongly agree* to 4 = *strongly disagree*) are divided across five subscales. In this study, all items were reverse-coded such that higher scores reflected greater endorsement traits. Total scores range from 20 to 80 and were computed using prorated scoring for participants with at least 80% (16) valid items. Other participants were deleted listwise from impulsivity models. Subscale scores were calculated using the same procedure. Total scale internal consistency was good ($\alpha = 0.81$) in this sample but varied across subscales ($\alpha = 0.62 - 0.80$).

Short Dark Tetrad

The psychopathy subscale of the Short Dark Tetrad (SD4) was used to measure psychopathy in a non-clinical population (Paulhus et al., 2021). The seven items rated on a five-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*) capture characteristics of impulsivity, fearlessness, aggression, and disregard for rules or authority (e.g., “People often say I’m out of control”, “I tend to fight authorities and their rules”). The subscale demonstrated acceptable internal consistency in this sample ($\alpha = .75$). Scores were computed

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using prorated scoring for cases with a minimum of six items (80%). Scores range from 7 to 35 with higher scores indicating stronger psychopathic traits.

Escalation Variables

Escalation was defined in this study as the act of viewing pornographic genres not subjectively experienced as arousing. Two escalation outcomes were tested in this study, taboo escalation (TE) and illegal escalation (IE).

Genre Escalation Scores. Individual genre escalation scores were computed based on arousal level and frequency of use for a given pornographic theme. Participants were given a list of 20 genres/themes varying in types and commonness (e.g., vaginal sex, sex with urine, sex with children) and responded to an arousal and a use item for each. Arousal was rated on a five-point Likert scale (1 = *not at all arousing* to 4 = *extremely arousing*) and frequency of use on a five-point Likert scale (0 = *never* to 4 = *always*). An escalation score was assigned only if the participant reported no arousal (score = 1) and a viewing frequency greater than 1 (never). In that case, the escalation score was equal to the viewing frequency with higher frequencies capturing higher degrees of escalation. If the genre was found arousing or not viewed at all, the escalation score was zero. Using continuous scales rather than dichotomizing escalation as present or absent preserved variability and statistical power for moderation analyses (Hayes, 2022) and allowed for capturing individual variations in the escalation intensity. Each escalation outcome was quantified by the sum of individual genre escalation scores belonging to either the illegal or taboo index. TE sum scores ranged from 0 to 28 and IE sum scores from 0 to 20.

Because an exploratory factor analysis failed to yield a usable structure and the IE grouping was bound to legal standards, the final indices were based on statutory criteria and classifications of taboo in prior research.

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Illegal Escalation Index. The illegal index grouped genres meeting legal definitions of criminal pornographic material. A genre was included when it involved minors (European Parliament & Council, 2011), depictions of threats to a person's life, serious injury to sexual organs or anus, sexual activity with a corpse, sexual acts with animals, or non-consensual penetration (Criminal Justice and Immigration Act 2008, §§ 63(7), 63(7A)). Contents composing the index were CSAM, underage, bestiality, snuff (i.e., women murdered in a sexual context), and rape.

Taboo Escalation Index. The taboo index included legal genres that depict paraphilic acts, have been identified as unusual in research, or are commonly perceived as taboo. Paraphilic refers to atypical sexual activities or targets that diverge from culturally normative patterns (American Psychiatric Association, 2013), and sadomasochism, fetish, coprophilia (feces), or urophilia (urine) content was included on this basis. Such content was found to evoke higher disgust and lower moral and ethical acceptance than mainstream content especially in females (Prantner et al., 2023). Bukkake content can be classified as unusual (Wéry & Billieux, 2016) involving extremity and degradation themes. Hentai was also considered taboo because it transgresses Western norms associating animation with childhood and non-sexual fantasy (Ortega-Brena, 2008). Content is often extreme or bizarre with fantastical creatures and fetishistic scenarios (Lawrence, 2015; Ortega-Brena, 2008), and is often criticized for normalizing sexual violence and depicting very young “barely legal” characters (Lawrence, 2015). These genres collectively have been conceptually and empirically categorized as niche, unusual, or deviant in prior research (e.g., Ballester-Arnal et al., 2023; Lawrence, 2015; Muris et al., 2020; Wéry & Billieux, 2016). The final index contained bukkake, feces, urine, violent sex, fetish, BDSM, and hentai categories.

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Covariates

Gender. The variable included five categories: male, female, non-binary/third gender, other, and prefer not to say. The latter category was removed without causing any exclusion. The “other” category was collapsed together with non-binary due to low frequency.

Age at First Use of Pornography. Participants indicated whether they first used pornography between 5–8 years, 9–12 years, 13–16 years, or after 16 years. Participants in the 5–8 years category were excluded from the analyses including the covariate due to the absence of escalation cases in this group.

Procedure

The study questionnaire was programmed in Qualtrics and advertised as approaching personality, mental health, and pornography use, including extreme and illegal content. Participants were informed on the collection and protection of their data, the potential adverse effects of participating, and the possibility to skip questions, take breaks, and withdraw consent at any time. Upon consent, they filled out the questionnaire in their own time, with questions presented in a randomized order. After completion, a debrief page featured contact details of support organizations on the discussed sensitive topics.

Data Processing and Statistical Analyses

Data Preparation

All statistical analyses were conducted using IBM SPSS and the PROCESS macro for SPSS (Hayes, 2022). Data were inspected for completeness and quality where cases of excessive missingness or failing to meet inclusion criteria were excluded. Outliers were screened using standardized residuals ± 3 , leverage values exceeding $(3k+2)/n$, or Cook's distance > 1 . Cases of escalation were flagged due to their rarity but retained in the main analyses, as they reflected the target construct of this study. One case was removed from the models predicting TE due to its disruptive influence on regression results. A preliminary

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exploratory factor analysis was conducted to obtain data-driven escalation indices but did not produce an interpretable solution and was therefore not used in subsequent analyses.

Descriptives and Correlational Statistics

Descriptive statistics were calculated for all study variables. Assumptions of linearity, normality, and homoscedasticity were assessed using scatterplots, histograms, Q-Q plots and normality statistics. Bivariate Pearson correlations were computed to examine relationships between focus variables. Because gender and age at first pornography use were categorical, point-biserial correlations were used to evaluate their relevance as covariates.

Moderation Models

Four moderation models were conducted using the PROCESS macro (Model 1) to test the study hypotheses. Model 1 and 2 inspected whether psychopathy moderated the relationships between PPU and TE or IE. Model 3 and 4 tested the same moderation for trait impulsivity. The model structure is shown in Appendix A.

Covariates varied across models based on theoretical relevance and bivariate correlations. Gender and age at first pornography use were included only in TE models (Models 1 and 3), as both showed associations with TE but not IE. Impulsivity and PPU were controlled for in models where they were not the focal predictor. TE and IE were controlled when they were not the outcome variable to account for their shared variance.

Continuous predictors were mean-centered for interpretability. Statistical significance was determined using 95% bootstrap confidence intervals (5,000 samples) due to violation of normality. Simple slopes analyses were conducted to probe significant interactions at $-1 SD$, mean, and $+1 SD$ levels of the moderator, and were interpreted using heteroscedasticity-consistent standard errors (HC3). Johnson–Neyman intervals were used to identify the values of the moderator where the conditional effect of the predictor was significant. Because

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PROCESS does not provide standardized regression coefficients or R^2 -change statistics for moderation models (Hayes, 2022), only model level R^2 were used as effect-size indicators.

Supplementary Analyses

Using the same procedure, 10 supplementary models tested each SUPPS-P facet separately. Each model examined whether psychopathy moderated the association between the specific impulsivity facet and each escalation outcome. Covariates stayed consistent with the main analyses.

Results

Preliminary Analyses

Descriptive Statistics

Descriptive statistics for study variables are presented in Table 1.

Table 1

Descriptive Statistics for Study Variables

Variable	<i>N</i>	Min	Max	<i>M</i>	<i>SD</i>	Skewness	Kurtosis
PPCS	323	18	89	31.83	15.59	1.51	1.79
SUPPS-P	321	24	64	41.90	7.38	0.35	0.33
Psychopathy	323	7	29	12.97	4.13	0.73	0.28
TE	323	0	2	0.09	0.34	3.93	15.85
IE	322	0	3	0.06	0.30	7.05	59.14

Note. PPCS = problematic pornography consumption scale; SUPPS-P = short UPPS-P impulsive behavior scale; TE = taboo escalation; IE = illegal escalation.

Baseline Questions. Participants answered baseline questions on pornography use. In this sample, nearly half of participants first viewed pornography between ages 13–16 years (48.4%); 30.1% reported initial exposure at ages 9–12 years; 19.6% after age 16 years; and

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1.9% at ages 5–8 years. No escalation cases were found in the 5–8 years group, so these participants were excluded from the analyses. Over the past six months, 52% of respondents ($n = 167$) spent more than one hour per week watching pornography, 23% ($n = 73$) spent 1–3 hours, 7% ($n = 23$) spent 4–6 hours, and 5% ($n = 15$) exceeded 7 hours. Fourteen percent ($n = 44$) reported no use in this time frame. Audiovisual sites (e.g., PornHub, xVideos) were by far the most used format, reported by 90.6 % of participants ($n = 289$). A high majority consumed explicit literature or fanfiction (60.2 %, $n = 192$), and a quarter used audio erotica (25.7 %, $n = 82$) or viewed erotic art (26.3 %, $n = 84$). Other reported formats included erotic video games, AI generated pornography, and daydreaming. Participants were asked whether they had ever viewed pornography illegal in their country; 10.5% reported having done so, and 22% were uncertain.

Escalation Rates. Escalation rates per genre and index are presented in Table 2.

Escalation overall occurred more frequently with taboo genres than illegal content. Within the TEI, escalation to violent sex content was the most frequent. Feces, BDSM and hentai content were equally the least frequent. Among IE themes, rape content and CSAM have respectively the most and least cases. There was no case of escalation to CSAM in this sample. TE was more frequent among men (12.3%) than women (4.6%). There were two cases of TE in the 14 (14.3%) non-binary participants. IE frequency was similar among men (4.4%) and women (4.1%), and present in one case of 14 non-binary participants (7.1%). Both indices showed very little variability, and highly skewed distributions, highlighting the rareness of escalation behaviors, with most scores around 0 and a low mean.

Table 2

Individual Genre Escalation Rates Grouped by Escalation Indices

Genre	Valid N	<i>n</i>	%
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TE total	323	25	7.7
Hentai	321	1	0.3
BDSM	321	1	0.3
Fetish	321	7	2.2
Violent sex	322	11	3.4
Bukkake	321	5	1.5
Urine	322	3	0.9
Feces	321	1	0.3
IE total	322	14	4.3
CSAM	322	0	0
Under 18	321	4	1.2
Snuff	322	3	0.9
Rape	322	8	2.5
Bestiality	320	2	0.6

Note. Percentages are based on valid responses. TE = taboo escalation; IE = illegal escalation.

Predictor Scales. The three predictor scales showed satisfactory variability in this sample, although scores did not cover the total ranges to the upper ends. PPU scores were skewed toward low scores, with half of the scores below 26, and six (1.9%) participants scoring above the clinical threshold (76) for PPU. This distribution was expected in a non-clinical sample. The psychopathy grand mean was lower in the current sample than both men and women's group means in the scale development sample (Paulhus et al., 2021). Impulsivity scores showed an appropriate distribution.

Correlations

Bivariate Pearson correlations among continuous study variables are presented in Table 3. TE and IE were positively correlated but only TE showed associations with other variables. Specifically, TE was positively associated with PPU but not with impulsivity and psychopathy. PPU, psychopathy, and impulsivity had significant positive correlations with one another, with impulsivity–psychopathy link being the strongest.

Point-biserial correlations indicated that gender and age at first pornography use were relevant covariates to TE, but not to IE. For gender (reference = male), the female dummy showed a negative association with TE ($r = -.15, p < .01$) whereas non-binary (vs. male) was unrelated ($r = .03, p = .58$). For age at first use (reference = 9–12 years), the >16 category had a small negative correlation with TE ($r = -.12, p = .04$), and the 13–16 years category showed no association ($r = -.03, p = .55$). None of the gender and age at first use dummies were significantly associated with IE: female ($r = -.02, p = .73$), non-binary ($r = .01, p = .84$), 13–16 years ($r = -.04, p = .48$), and >16 ($r = -.04, p = .46$).

Table 3

Bivariate Pearson Correlations Among Study Variables

Variable	1	2	3	4	5
1. PPU	—				
2. Impulsivity	.22**	—			
3. Psychopathy	.23**	.58**	—		
4. TE	.18**	-.03	.08	—	
5. IE	.06	-.03	.01	.31**	—

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Note. $N = 314$ – 323 depending on variable pair. PPU = problematic pornography use; TE = taboo escalation; IE = illegal escalation.

****** $p < .01$ (2-tailed).

Hypothesis Testing

Model 1: PPU, Psychopathy, and Taboo Escalation

Model 1 tested whether PPU predicted TE and whether this relationship was moderated by psychopathy, controlling for IE, impulsivity, gender, and age at first exposure (Table 4). The model explained 21% of the variance ($R^2 = .21$). PPU significantly positively predicted TE. Psychopathy showed no significant main effect, and the interaction between PPU and psychopathy was not significant.

Table 4

Bootstrap OLS Regression (PROCESS) for Model 1 Predicting Taboo Escalation

Variable	b	SE	95% CI	
			LL	UL
PPU	<.01*	<.01	<.01	.01
Psychopathy	<.01	<.01	<.01	.01
PPU x Psychopathy	<.01	<.01	<.01	<.01
Illegal Escalation	.51*	.15	.15	.76
Impulsivity	−.01	<.01	−.01	<.01
Female (vs. Male)	−.03	<.01	−.11	.05
Non-binary (vs. Male)	.02	.09	−.13	.21
First Use 13–16 (vs. 9–12)	−.06	.05	−.15	.03

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Variable	<i>b</i>	<i>SE</i>	95% CI	
			<i>LL</i>	<i>UL</i>
First use > 16 (vs. 9–12)	–.09 *	.04	–.18	–.01

Note. *N* = 312. CI = bias-corrected and accelerated 95 % confidence interval based on 5,000 resamples; *LL* = lower limit; *UL* = upper limit; PPU = problematic pornography use. * indicates that the confidence interval does not include zero ($\alpha = .05$).

Model 2: PPU, Psychopathy, and Illegal Escalation

This model tested the moderating effect of psychopathy on the relationship between PPU and IE, controlling for TE and impulsivity (Table 5). The model accounted for 11% of the variance ($R^2 = .11$). Neither PPU nor psychopathy showed significant main effects. The interaction between PPU and psychopathy was significant, indicating that the association between PPU and IE became negative at high psychopathy. Simple slopes were not significant at -1 *SD* ($b < .01$, 95% CI [$< .01$, $.01$]), at the mean ($b < .01$, 95% CI [$< .01$, $< .01$]), or at $+1$ *SD* of psychopathy ($b < .01$, 95% CI [$< .01$, $< .01$]). The Johnson–Neyman analysis showed that the effect became significant at psychopathy scores above 21.7 (> 2 *SD*).

Table 5

Bootstrap OLS Regression (PROCESS) for Model 2 Predicting Illegal Escalation

Variable	<i>b</i>	<i>SE</i>	95 % CI	
			<i>LL</i>	<i>UL</i>
PPU	<.01	<.01	<.01	.01
Psychopathy	<.01	<.01	–.01	.01
PPU x Psychopathy	<.01*	<.01	<.01	<.01
Impulsivity	<.01	<.01	–.01	<.01

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Variable	<i>b</i>	<i>SE</i>	95 % CI	
			<i>LL</i>	<i>UL</i>
Taboo Escalation	.28*	.15	.03	.58

Note. $N = 320$. CI = bias-corrected and accelerated 95 % confidence interval based on 5,000 resamples; *LL* = lower limit; *UL* = upper limit. PPU = problematic pornography use. * indicates that the confidence interval does not include zero ($\alpha = .05$).

Model 3: Impulsivity, Psychopathy, and Taboo Escalation

The model tested whether impulsivity predicted TE and whether this relationship was moderated by psychopathy, controlling for IE, PPU, gender, and age at first use (Table 6). The model captured 21% of the variance in TE ($R^2 = .21$). General impulsivity did not significantly predict TE. Psychopathy had no significant effect on TE, and the interaction of impulsivity and psychopathy was not significant.

Table 6

Bootstrap OLS Regression (PROCESS) for Model 3 Predicting Taboo Escalation

Variable	<i>b</i>	<i>SE</i>	95 % CI	
			<i>LL</i>	<i>UL</i>
Impulsivity	<.01	<.01	-.01	<.01
Psychopathy	.07	.01	<.01	.02
Impulsivity x Psychopathy	<.01	<.01	<.01	<.01
Illegal Escalation	.51*	.15	.14	.74
PPU	<.01*	<.01	<.01	.01
Female (vs Male)	-.02	.04	-.11	.06
Non-binary (vs Male)	.02	.09	-.14	.22

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Variable	<i>b</i>	<i>SE</i>	95 % CI	
			<i>LL</i>	<i>UL</i>
First Use 13 – 16 (vs. 9–12)	–.07	.05	–.16	.02
First use > 16 (vs. 9-12)	–.09*	.04	–.18	–.01

Note. *N* = 312. CI = percentile bootstrap 95 % confidence interval based on 5,000 resamples; *LL* = lower limit; *UL* = upper limit; PPU = problematic pornography use. * indicates that the confidence interval does not include zero ($\alpha = .05$).

Model 4: Impulsivity, Psychopathy, and Illegal Escalation

Model 4 tested the interaction of impulsivity and psychopathy in predicting IE controlling for TE and PPU (Table 7). The predictors accounted for 10% of the variance ($R^2 = .10$). Neither impulsivity nor psychopathy showed a significant main effect on IE. The interaction between impulsivity and psychopathy was not significant.

Table 7

Bootstrap OLS Regression (PROCESS) for Model 4 Predicting Illegal Escalation

Variable	<i>b</i>	<i>SE</i>	95% CI	
			<i>LL</i>	<i>UL</i>
Impulsivity	<.01	<.01	–.01	<.01
Psychopathy	<.01	.01	–.01	.01
Impulsivity x Psychopathy	<.01	<.01	<.01	<.01
PPU	<.01	<.01	<.01	<.01
Taboo Escalation	.27*	.15	.02	.59

Note. *N* = 320. CI = percentile-bootstrap 95 % confidence interval based on 5,000 resamples; *LL* = lower limit; *UL* = upper limit; PPU = problematic pornography use. * indicates that the

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confidence interval does not include zero ($\alpha = .05$).

Supplementary Analyses

Supplementary analyses tested the general impulsivity models with each SUPPS-P subscale separately. The results of all 10 moderation models are presented in Tables B1 and B2 (Appendix B). Only Model 3b showed effects of interest: sensation-seeking negatively predicted TE, and this effect was strengthened by increases in psychopathy. The effect of sensation-seeking on TE was not significant at -1 *SD* of psychopathy ($b = -.01$, 95% CI $[-.02, .01]$), but was significant at the mean ($b = -.03$, 95% CI $[-.05, -.01]$), and at $+1$ *SD* ($b = -.04$, 95% CI $[-.08, -.01]$). The Johnson–Neyman analysis showed that the effect became significant when psychopathy scores exceeded 10.43.

Discussion

This study investigated whether PPU and impulsivity are associated with the consumption of pornographic genres without arousal, and whether the presence of psychopathic traits influence these relationships. It was hypothesized that these effects would differ for taboo and illegal materials, such that PPU and impulsivity only predict TE with no influence of psychopathy while they would predict IE only when psychopathy is present. The effects of the age at first use and gender covariates observed in this study aligned with those of (Dwulit & Rzymiski, 2019). Participants who began using pornography younger were more likely to report TE, supporting that early exposure may accelerate habituation. Initial gender differences in TE disappeared after controlling for other factors.

PPU and Psychopathy

PPU was positively associated with TE regardless of psychopathy levels, supporting H1. Ballester-Arnal et al. (2023) questioned whether the association between PPU and the use of paraphilic content could be explained by prior interest or habituation. Taking arousal as a

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measure of interest (Seto et al., 2021), the present findings provide evidence for the habituation hypothesis, though not precluding prior interest. Escalation to taboo materials among individuals high on PPU is likely a manifestation of diminished arousal and general sexual function (Hanseder & Dantas, 2023; Ince et al., 2023, 2024; Sharpe & Mead, 2021) rather than sexual curiosity (Ince et al., 2023), where seeking arousal surpasses seeking satisfaction of sexual fantasies. The current findings further support qualitative tolerance as a marker of PPU (Bóthe et al., 2018; Ince et al., 2021, 2023, 2024). PPU seems sufficient for this process that seemingly does not require rule-breaking or impulsive tendencies given the null results of psychopathy and impulsivity in this model.

Contrastingly, PPU did not uniquely influence IE, in line with H2. While PPU may be sufficient to drive escalation to taboo materials through habituation processes, it may not override moral or legal boundaries. The feelings of shame, guilt, or disgust often reported in PPU (Hanseder & Dantas, 2023; Ince et al., 2023, 2024; Lewczuk et al., 2022) may inhibit the progression when aware of legal consequences. Some men with PPU describe their arousal during pornography use as more mental than physical (Ince et al., 2023), which may allow a reassessment of the ongoing potentially hyperfocused sexual arousal state when faced with such extreme content. This finding contrasts with Sharpe and Mead's (2021) observations that arousal impairments foster "appetites for viewing CSAM". However, this might instead reflect the absence of CSAM escalation in this sample, raising the question of whether escalation in CSAM differs from other illegal materials.

Contrary to expectations, psychopathy negatively moderated the relationship between PPU and IE. For individuals very high on psychopathy, PPU severity was associated with lower IE. Although psychopathy was expected to weaken moral inhibition and facilitate IE in individuals with PPU (H2), this inverse effect suggests otherwise. A possible explanation is that paraphilic interest or arousal is a prerequisite for the use of illegal materials in

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psychopaths, as opposed to how escalation manifests. Indeed, research indicates that antisocial personality traits are associated with greater paraphilic arousal (Longpré et al., 2022) and arousal to a wider range of sexual content (Paul, 2009). Specifically, psychopathy facilitates the translation of deviant sexual fantasies into corresponding behavior (de Roos et al., 2025; Williams et al., 2008). Because psychopaths are reward-seeking (Malesza & Ostaszewski, 2016), and sexual gratification is the focus reward during hyperfocused arousal (Knack et al., 2020; Loewenstein, 1996), they may rather act directly on preferences than engage with non-arousing content. Diminished arousal in PPU may deter the content's rewarding value, inducing boredom or sexual frustration in psychopaths that override the excitement of transgression. The combination of these facets of psychopathy and PPU provides a possible explanation for the absence of direct association between psychopathy and IE and the unexpected direction of the moderation effect.

Impulsivity and Psychopathy

None of the hypothesized effects of impulsivity were supported (H3, H4). Impulsivity was unrelated to escalation to taboo and illegal materials even in the presence of psychopathy, suggesting that escalation may not stem from impulsive tendencies. Previous findings linking impulsivity to engagement in taboo paraphilias regardless of concordance with fantasies (de Roos et al., 2025) may not generalize to pornography use or imply the absence of arousal. Indeed, the presence of a fantasy does not always imply corresponding arousal (Longpré et al., 2022). Moreover, studies previously identifying impulsivity as a driver for viewing illegal materials mainly rely on samples where sexual deviance is a dominant predictor (e.g., de Souza Aranha e Silva & Baltieri, 2016) and focus on CSAM while no case of CSAM escalation was found in this sample. These findings together suggest that escalation may be better explained by habituation and desensitization than rash action. This interpretation is further supported by the significant effect of PPU and early age of first exposure to

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pornography as covariates in this model. Indeed, research showed that early exposure was associated with the need for increasingly intense sexual stimuli to reach orgasm (Dwulit & Rzymiski, 2019), and later use of deviant materials (Seigfried-Spellar & Rogers, 2013).

It is possible that analyzing total impulsivity scores obscured more specific effects. Further analyses on individual facets supported this rationale, supporting H5 only partially. Contrary to expectations, urgency facets were not associated with escalation, and individuals high on sensation-seeking less likely reported escalation to taboo genres. While prior research indicates that sensation-seeking drives engagement with unconventional genres (Bocci Benucci et al., 2024), the present findings suggest that this engagement is rather driven by sexual arousal. Supporting this, Kalyan et al. (2025) found that high sensation-seekers are more likely to binge-watch pornography when motivated by excitement and fantasy but are less likely to do so out of diversion. This suggests that boredom relief or entertainment is insufficient for sensation-seekers to engage with pornography. The disengaged, low-stimulation use that is escalation may therefore be incompatible with sensation-seeking tendencies. In other words: if there is no sensation, there is no seeking.

Psychopathy further strengthened this negative relationship, suggesting that the combination of psychopathy and sensation-seeking further amplifies the unrewarding effect of using non-arousing taboo materials. Yet, it is also possible that participants high on these constructs misinterpreted thrill for arousal and were therefore not identified as escalating. The inverse effects of sensation-seeking and psychopathy could also be attributed to gender differences, as both factors have been shown to influence arousal and use of pornographic genres differently between men and women (Paul, 2009). For instance, the need for increased intensity in pornographic materials more frequently occurs in males reporting aggressive tendencies (e.g., psychopathic traits), and females perceiving themselves as curious (e.g., sensation-seeking) (Dwulit & Rzymiski, 2019). Escalation may not be quantitatively but

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qualitatively different across genders and serve different functions, potentially accounting for the observed effects of sensation-seeking and psychopathy in the general sample. Analyzing genders together might have obscured potential gender-specific effects.

This pattern did not extend to illegal escalation, contrasting with the negative moderation of psychopathy emerging only in the PPU–IE relationship. Psychopathy reduced escalation to illegal materials among individuals with more severe PPU but did so only in the case of taboo materials for sensation-seekers. Individuals with PPU may still engage with extreme but legal content to recover arousal, outweighing the reward sensitivity of psychopathy. Psychopathy may reduce engagement only at the point where they no longer seek arousal but face its absence when confronted with repulsive illegal content. The moderating effect of psychopathy emerges at the taboo level because the content is already unrewarding enough for sensation-seekers to disengage, even without psychopathy. This divergence supports escalation as more consistent with PPU processes than thrill-seeking.

Theoretical Considerations and Broader Implications

Taken together, the present findings offer a nuanced consideration of Knack et al.'s (2020) framework of opportunistic escalation in pornography to a sub-clinical sample. Given the absence of CSAM escalation in this sample, conclusions drawn from this study only pertain to non-CSAM illegal content. However, the model remains relevant to the reflection on the current findings. Although neither of the predictors conceptualized by Knack et al. (2020) (i.e., PPU and impulsivity) were associated with illegal escalation, they showed a connection to taboo escalation. Participants engaging in any genre escalation conceptually belong to the opportunistic non-deviant pathway. Furthermore, the findings reveal that individuals who escalate to taboo content are more likely to escalate to illegal content, suggesting that both outcomes share the same underlying behavioral process. Future studies should compare those who show one type of escalation with those showing both to clarify this

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overlap. It is also possible that the absence of CSAM escalation in this sample itself explains the present findings, which would suggest that mechanisms differ for CSAM and non-CSAM illegal materials.

Knack et al.'s (2020) model posits that escalation emerges from PPU features and impulsive sensation-seeking tendencies, occurring during a state of hyperfocused arousal. Contrastingly, the present study only found evidence for the role of desensitization in the behavior, but not for the role of impulsivity. Escalation might be better viewed as an impulsive act emerging from the "visceral state" (Loewenstein, 1996) rather than reflecting underlying predispositions. Knack et al. (2020) identified hyperfocused arousal as a momentary state that interrupts once sexual gratification is met. Thus, escalation may reflect state-impulsivity rather than trait-impulsivity measured in this study. Sensation-seeking and psychopathy not providing the expected positive predictive influence aligns with this distinction. Impulsive and antisocial traits appear irrelevant, or even inhibitory when momentary arousal is lacking. Testing PPU and impulsivity independently revealed the predominant importance of PPU in the escalation process and suggests that an interaction between the two factors may be more relevant to illegal escalation. These findings together support the dynamic nature of the process proposed by Knack et al. (2020) incorporating distal and proximal factors.

The temporal distinction between behavioral facilitation (i.e., early engagement) and further maintenance of the behavior proposed in Knack et al.'s (2020) model offers an additional explanation to the current findings. While behavioral facilitation stems from the discussed interaction, maintenance relies on PPU features and conditioned arousal. However, this study only captured current behavior, reflecting behavioral maintenance more than initiation, with impulsivity being less relevant. Therefore, participants who have engaged in escalation before might have gone unnoticed if arousal is conditioned and now concordant

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with the content used. For instance, some CSAM offenders have reported only masturbating a few months after starting to watch (Surjadi et al., 2010), and preferences in pornography generally tend to change over time (Dwulit & Rzymiski, 2019). Future studies should assess escalation longitudinally or as a lifetime occurrence to explore this temporal distinction, detecting more cases and potentially identifying protective factors.

Limitations and Future Directions

This study comes with limitations, and results should therefore be interpreted with caution. Escalation cases were rare, limiting statistical power and stability of the estimates. The use of PROCESS and bootstrap prevented comparison between standardized coefficients and the interpretability of effect sizes, which would have allowed a hierarchical interpretation of the different factors and directed future research. No CSAM escalation cases were identified, limiting the generalizability of the results to non-CSAM materials and preventing conclusions on the illegal content most examined in previous research.

A key limitation of this study lies in the measurement of escalation itself. The operationalization used in this study that requires complete absence of arousal may have undervalued the behavior's complexity and excluded more ambiguous cases. Furthermore, the arousal and use items referred to current behavior, providing little information about past viewing patterns while pornography escalation is seen as a gradual process (D'Orlando & Ricciotti, 2021; Dwulit & Rzymiski, 2019; Hanseder & Dantas, 2023; Ince et al., 2023, 2024; Knack et al., 2020; Rimer & Holt, 2022; Steely et al., 2018).

Additionally, the grouping of genres into taboo and illegal was not empirically derived. The indices may combine behaviors that do not naturally cluster together, limiting construct validity and measurement reliability, attenuating associations with predictors. For example, research suggests that the strength of concordance between interest and behavior differs across paraphilias (Seto et al., 2021). The conceptually imposed groupings may also not align

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with gendered or cultural perceptions of taboo, possibly accounting for the null gender effects. The perceived commonness of genres varies across genders (Paul, 2009) and likely sexual orientations, where gay male content may be taboo for heterosexual men but was not part of the TE index. For instance, 60,9% of students report using genres contrary to their sexual orientation over the course of exposure (Dwulit & Rzymiski, 2019). Some men with PPU report questioning their sexuality when increasing the intensity or diversifying their use, which disappears upon interruption of the behavior (Hanseder & Dantas, 2023). Another issue with the TEI is that all genres are placed on the same level of taboo, failing to reflect intensity gradations, although subjective themselves. Further research should investigate the structure of escalation with consideration to gender, culture, and sexual orientation to develop empirically validated groupings.

Other limitations include potential response biases and sample characteristics. Given the sensitivity of the topic and the self-report format, participants may have underreported pornography use or illegal acts, and social desirability may have influenced responses to personality measure. The sample lacked representativeness because it was mostly composed of young students from western countries identifying in a binary gender.

Despite these limitations, this study provides a step toward quantitatively capturing pornography escalation as a single measurable construct, while prior research has focused on quantitative tolerance or looked at arousal and use separately. Moreover, it focuses on the understudied non-paraphilic community population. The current results, together with the identified limitations, emphasize that the construct of escalation itself warrants deeper investigation to uncover its latent structure and conceptual boundaries to better identify its predictors.

References

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). <https://doi.org/10.1176/appi.books.9780890425596>
- Ballester-Arnal, R., García-Barba, M., Castro-Calvo, J., Giménez-García, C., & Gil-Llario, M. D. (2023). Pornography Consumption in People of Different Age Groups: an Analysis Based on Gender, Contents, and Consequences. *Sexuality Research and Social Policy*, 20(2), 766–779. <https://doi.org/10.1007/s1317802200720z>
- Bocci Benucci, S., Di Gesto, C., Simon, G., Silvia, C., & Giulia, F. (2024). Pornography use, problematic pornography use, impulsivity, and sensation seeking: a metaanalysis. *J Sex Med*, 21(10), 922–939. <https://doi.org/10.1093/jsxmed/qdae101>
- Bőthe, B., Tóth-Király, I., Bella, N., Potenza, M. N., Demetrovics, Z., & Orosz, G. (2021). Why do people watch pornography? The motivational basis of pornography use. *Psychology of Addictive Behaviors*, 35(2). <https://doi.org/10.1037/adb0000603>
- Bőthe, B., Tóth-Király, I., Zsila, Á., Griffiths, M. D., Demetrovics, Z., & Orosz, G. (2018). The Development of the Problematic Pornography Consumption Scale (PPCS). *The Journal of Sex Research*, 55(3), 395–406. <https://doi.org/10.1080/00224499.2017.1291798>
- Castro-Calvo, J., Cervigón-Carrasco, V., Ballester-Arnal, R., & Giménez-García, C. (2021). Cognitive processes related to problematic pornography use (PPU): A systematic review of experimental studies. *Addictive Behaviors Reports*, 13, 100345. <https://doi.org/10.1016/j.abrep.2021.100345>
- Castro-Calvo, J., Giménez-García, C., Gil-Llario, M. D., & Ballester-Arnal, R. (2018). Motives to Engage in Online Sexual Activities and Their Links to Excessive and Problematic Use: a Systematic Review. *Current Addiction Reports*, 5(4), 491–510. <https://doi.org/10.1007/s404290180230y>

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Criminal Justice and Immigration Act 2008, c. 4 (UK).

<https://www.legislation.gov.uk/ukpga/2008/4>

Cyders, M. A., Littlefield, A. K., Coffey, S., & Karyadi, K. A. (2014). Examination of a short English version of the UPPS-P Impulsive Behavior Scale. *Addictive Behaviors*, 39(9), 1372-1376. <https://doi.org/10.1016/j.addbeh.2014.02.013>

Cyders, M. A., & Smith, G. T. (2007). Mood-based rash action and its components: Positive and negative urgency. *Personality and Individual Differences*, 43(4), 839–850. <https://doi.org/10.1016/j.paid.2007.02.008>

de Roos, M., Longpré, N., & Dongen, V. (2025). When Kinks Come to Life: An Exploration of Paraphilic Behaviors and Underlying Predictors. *The Journal of Sex Research*, 62(3), 317–329. <https://doi.org/10.1080/00224499.2024.2319242>

de Souza Aranha e Silva, R. A., & Baltieri, D. A. (2016). A Preliminary Model of Motivation for Pornography Consumption Among Men Participating in Zoophilic Virtual Environments. *Journal of Sex & Marital Therapy*, 42(2), 143–157. <https://doi.org/10.1080/0092623X.2014.996930>

D’Orlando, F., & Ricciotti, S. (2021). The economics of escalation. *Rationality and Society*, 33(1), 106-140. <https://doi.org/10.1177/1043463120985310>

Dwulit, A. D., & Rzymiski, P. (2019). Prevalence, Patterns and Self-Perceived Effects of Pornography Consumption in Polish University Students: A Cross-Sectional Study. *International Journal of Environmental Research and Public Health*, 16(10), 1861. <https://doi.org/10.3390/ijerph16101861>

European Parliament and Council. (2011). Directive 2011/93/EU on combating the sexual abuse and sexual exploitation of children and child pornography. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32011L0093>

Hanseder, S., & Dantas, J. A. R. (2023). Males’ Lived Experience with Self-Perceived

FROM CURIOSITY TO CRIMINALITY

- Pornography Addiction: A Qualitative Study of Problematic Porn Use. *International Journal of Environmental Research and Public Health*, 20(2), 1497.
<https://doi.org/10.3390/ijerph20021497>
- Hayes, A. F. (2022). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (3rd ed.). Guilford Press.
- Ince, C., Albertella, L., Liu, C., Tiego, J., Fontenelle, L. F., Chamberlain, S. R., Yücel, M., & Rotaru, K. (2024). Problematic pornography use and novel patterns of escalating use: A crosssectional network analysis with two independent samples. *Addictive Behaviors*, 156, 108048. <https://doi.org/10.1016/j.addbeh.2024.108048>
- Ince, C., Fontenelle, L. F., Carter, A., Albertella, L., Tiego, J., Chamberlain, S. R., & Rotaru, K. (2023). Clarifying and extending our understanding of problematic pornography use through descriptions of the lived experience. *Scientific Reports*, 13(1), 18193. <https://doi.org/10.1038/s41598023454598>
- Ince, C., Yücel, M., Albertella, L., & Fontenelle, L. F. (2021). Exploring the clinical profile of problematic pornography use. *CNS Spectrums*, 26(6), 648–657. <https://doi.org/10.1017/s1092852920001686>
- Kalyan, S., Menon, D., & Mariyappan, S. V. (2025). The infinite scroll ... exploring the motivations and individual differences in bingewatching behavior on porn tube sites. *Social Sciences & Humanities Open*, 11, 101279. <https://doi.org/10.1016/j.ssaho.2025.101279>
- Knack, N., Holmes, D., & Fedoroff, J. P. (2020). Motivational pathways underlying the onset and maintenance of viewing child pornography on the Internet. *Behavioral Sciences & the Law*, 38(2), 100–116. <https://doi.org/10.1002/bsl.2450>
- Lanning, K. V. (2001). Child molesters and cyber pedophiles: A behavioral perspective. In R. Hazelwood & A. W. Burgess (Eds.), *Practical aspects of rape investigation: A*

multidisciplinary approach (3rd ed., pp. 199–220). CRC Press.

Lawrence, M. (2015). *Investigating Young People's Perspectives on Pornography and its Legal Regulation*. <http://etheses.dur.ac.uk/12496/>

Lewczuk, K., Wizła, M., Glica, A., Potenza, M. N., Lew-Starowicz, M., & Kraus, S. W.

(2022). Withdrawal and tolerance as related to compulsive sexual behavior disorder and problematic pornography use – Preregistered study based on a nationally representative sample in Poland. *Journal of Behavioral Addictions*, 11(4), 979–993. <https://doi.org/10.1556/2006.2022.00076>

Loewenstein, G. (1996). Out of Control: Visceral Influences on Behavior. *Organizational Behavior and Human Decision Processes*, 65(3), 272–292.

<https://doi.org/10.1006/obhd.1996.0028>

Longpré, N., Galiano, C. B., & Guay, J. (2022). The impact of childhood trauma, personality, and sexuality on the development of paraphilias. *Journal of Criminal Justice*, 82, 101981. <https://doi.org/10.1016/j.jcrimjus.2022.101981>

Lynam, D. R. (2013). *UPPS-P Impulsive Behavior Scale--Short English Version (SUPPS-P)* [Database record]. APA PsycTests. <https://doi.org/10.1037/t34116-000>

Malesza, M., & Ostaszewski, P. (2016). Dark side of impulsivity — Associations between the Dark Triad, selfreport and behavioral measures of impulsivity. *Personality and Individual Differences*, 88, 197–201. <https://doi.org/10.1016/j.paid.2015.09.016>

Muris, P., Otgaar, H., Meesters, C., Papasileka, E., & Pineda, D. (2020). The Dark Triad and Honesty-Humility: A Preliminary Study on the Relations to Pornography Use. *Dignity: A Journal on Sexual Exploitation and Violence*, 5(1). <https://doi.org/10.23860/dignity.2020.05.01.03>

Napier, S. S., Seto, M. C., Cashmore, J., & Shackel, R. (2024). Characteristics that predict exposure to and subsequent intentional viewing of child sexual abuse material among

FROM CURIOSITY TO CRIMINALITY

a community sample of Internet users. *Child Abuse & Neglect*, 156, 106977.

<https://doi.org/10.1016/j.chiabu.2024.106977>

National Center for Missing & Exploited Children. (2024). *CyberTipline Data*.

<https://www.missingkids.org/gethelpnow/cybertipline/cybertiplinedata#overview>

Ortega-Brena, M. (2008). Peek-a-boo, I See You: Watching Japanese Hard-core Animation.

Sexuality & Culture, 13(1), 17–31. <https://doi.org/10.1007/s12119-008-9039-5>

Parliamentary Assembly of the Council of Europe. (2011). *Pornography: A threat to human dignity* (Doc. 12695). Council of Europe. <https://pace.coe.int/en/files/13173/html>

Paul, B. (2009). Predicting Internet Pornography Use and Arousal: The Role of Individual Difference Variables. *Journal of Sex Research*, 46(4), 344–357.

<https://doi.org/10.1080/00224490902754152>

Paulhus, D. L., Buckels, E. E., Trapnell, P. D., & Jones, D. N. (2021). Screening for Dark Personalities. *European Journal of Psychological Assessment*, 37(3), 208–222.

<https://doi.org/10.1027/1015-5759/a000602>

Paulhus, D. L., & Williams, K. M. (2002). The Dark Triad of personality: Narcissism, Machiavellianism, and psychopathy. *Journal of Research in Personality*, 36(6), 556–563. [https://doi.org/10.1016/S00926566\(02\)005056](https://doi.org/10.1016/S00926566(02)005056)

Prantner, S., Giménez-García, C., Espino-Payá, A., Escrig, M. A., Fuentes-Sánchez, N., Ballester-Arnal, R., & Carmen Pastor, M. (2023). Female Affective Perception of Mainstream and Paraphilic Pornography: Associations with Sexual and Psychological Intrapersonal Variables. *Archives of Sexual Behavior*, 53(2), 715–733.

<https://doi.org/10.1007/s10508-023-02701-8>

Ray, J. V., Kimonis, E. R., & Seto, M. C. (2013). Correlates and Moderators of Child Pornography Consumption in a Community Sample. *Sex Abuse*, 26(6), 523–545.

<https://doi.org/10.1177/1079063213502678>

FROM CURIOSITY TO CRIMINALITY

Rimer, J. R., & Holt, K. (2022). “It was in Control of Me”: Notions of Addiction and Online Child Sexual Exploitation Material Offending. *Sex Abuse*, 35(1), 3–30.

<https://doi.org/10.1177/10790632211070797>

Seigfried-Spellar, K. C., & Rogers, M. K. (2013). Does deviant pornography use follow a Guttmanlike progression? *Computers in Human Behavior*, 29(5), 1997–2003.

<https://doi.org/10.1016/j.chb.2013.04.018>

Seto, M. C., & Ahmed, A. G. (2014). Treatment and Management of Child Pornography Use. *Sexual Deviation: Assessment and Treatment*, 37(2), 207–214.

<https://doi.org/10.1016/j.psc.2014.03.004>

Seto, M. C., Curry, S., Dawson, S. J., Bradford, J. M. W., & Chivers, M. L. (2021). Concordance of Paraphilic Interests and Behaviors. *The Journal of Sex Research*, 58(4), 1–14. <https://doi.org/10.1080/00224499.2020.1830018>

Sharpe, M., & Mead, D. (2021). Problematic Pornography Use: Legal and Health Policy Considerations. *Current Addiction Reports*, 8(4), 556–567.

<https://doi.org/10.1007/s40429021003908>

Shim, J. W., Lee, S., & Paul, B. (2007). Who Responds to Unsolicited Sexually Explicit Materials on the Internet?: The Role of Individual Differences. *CyberPsychology & Behavior*, 10(1), 71–79. <https://doi.org/10.1089/cpb.2006.9990>

Sindermann, C., Sariyska, R., Lachmann, B., Brand, M., & Montag, C. (2018). Associations between the dark triad of personality and unspecified/specific forms of Internet use disorder. *Journal of Behavioral Addictions*, 7(4), 985–992.

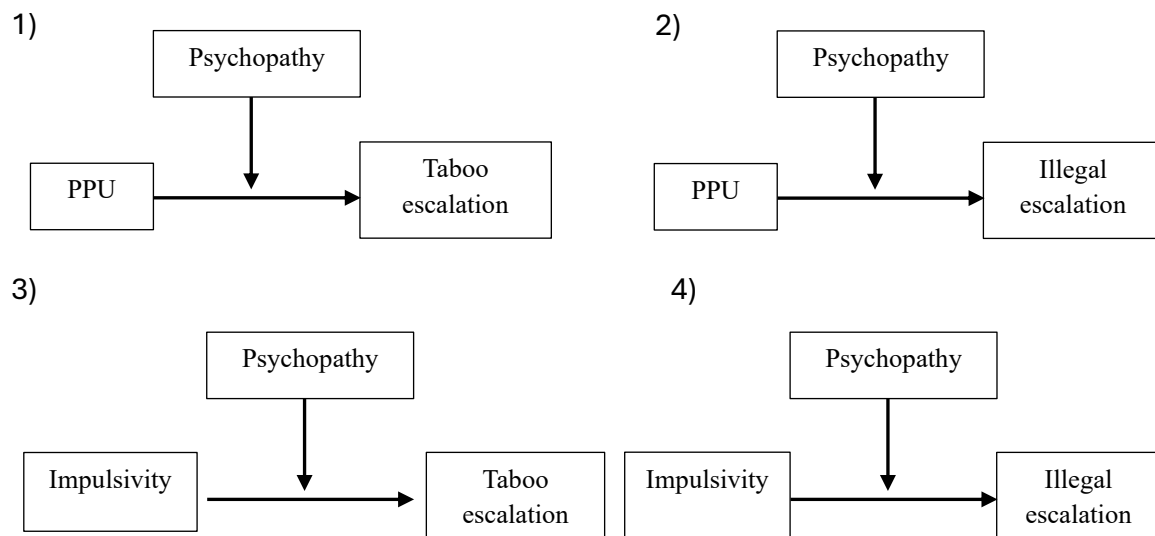
<https://doi.org/10.1556/2006.7.2018.114>

Steely, M., Bense, T., Bratton, T., & Lytle, R. (2018). All part of the process? A qualitative examination of change in online child pornography behaviors. *Criminal Justice Studies*, 31(3), 279–296. <https://doi.org/10.1080/1478601x.2018.1492389>

FROM CURIOSITY TO CRIMINALITY

- Surjadi, B., Bullens, R., van Horn, J., & Bogaerts, S. (2010). Internet offending: Sexual and non-sexual functions within a Dutch sample. *Journal of Sexual Aggression, 16*(1), 47–58. <https://doi.org/10.1080/13552600903470054>
- Varod, S., Stern, A., Bőthe, B., & Gewirtz-Meydan, A. (2024). Who Finds Pornography Stressful? A Latent Profile Analysis. *Archives of Sexual Behavior, 53*(9), 3393–3404. <https://doi.org/10.1007/s10508024029270>
- Wéry, A., & Billieux, J. (2016). Online sexual activities: An exploratory study of problematic and non-problematic usage patterns in a sample of men. *Computers in Human Behavior, 56*, 257–266. <https://doi.org/10.1016/j.chb.2015.11.046>
- Wéry, A., & Billieux, J. (2017). Problematic cybersex: Conceptualization, assessment, and treatment. *Addictive behaviors, 64*, 238–246. <https://doi.org/10.1016/j.addbeh.2015.11.007>
- West, S. J., Psederska, E., Bozgunov, K., Nedelchev, D., Vasilev, G., Thomson, N. D., & Vassileva, J. (2023). Identifying distinct profiles of impulsivity for the four facets of psychopathy. *PLOS ONE, 18*(4), e0283866-. <https://doi.org/10.1371/journal.pone.0283866>
- Whiteside, S. P., & Lynam, D. R. (2001). The Five Factor Model and impulsivity: using a structural model of personality to understand impulsivity. *Personality and Individual Differences, 30*(4), 669–689. [https://doi.org/10.1016/s0191-8869\(00\)00064-7](https://doi.org/10.1016/s0191-8869(00)00064-7)
- Williams, K. M., Cooper, B. S., Howell, T. M., Yuille, J. C., & Paulhus, D. L. (2008). Inferring sexually deviant behavior from corresponding fantasies: The role of personality and pornography consumption. *Criminal Justice and Behavior, 36*(2), 2. <https://doi.org/10.1177/0093854808327277>

Appendix A: Visualization of the Four Moderation Models Predicting Escalation



Note. PPU = problematic pornography use. Model 1 tested whether PPU predicted taboo escalation with no moderating effect of psychopathy (H1). Model 2 tested whether psychopathy moderated the association between PPU and illegal escalation (H2). Models 3 and 4 tested the same hypotheses as Models 1 and 2, respectively, using impulsivity instead of PPU (H3, H4). Gender and age at first pornography use were covariates in Model 1 and 3.

Appendix B: Regression Tables for Supplementary Analyses on SUPPS-P Facets**Table B1***Bootstrap OLS Regressions (PROCESS) Using SUPPS-P Subscales to Predict Taboo Escalation*

Variable	Model 3b		Model 3c		Model 3d		Model 3e		Model 3f	
	<i>b (SE)</i>	95% CI	<i>b (SE)</i>	95% CI	<i>b (SE)</i>	95% CI	<i>b (SE)</i>	95% CI	<i>b (SE)</i>	95% CI
Constant	.09 (.07)	[−.05, .23]	.03 (.07)	[−.11, .17]	.05 (.07)	[−.09, .17]	.06 (.07)	[−.08, 0.21]	.05 (.07)	[−.08, .19]
Sensation Seeking	−.03* (.01)	[−.04, −.01]	—	—	—	—	—	—	—	—
Negative Urgency	—	—	−.01 (.01)	[−.02, .01]	—	—	—	—	—	—
Positive Urgency	—	—	—	—	−.01 (.01)	[−.03, <.01]	—	—	—	—
Lack of Perseverance	—	—	—	—	—	—	.01 (.01)	[−.01, .03]	—	—
Lack of Premeditation	—	—	—	—	—	—	—	—	<.01 (.01)	[−.02, .03]

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Variable	Model 3b		Model 3c		Model 3d		Model 3e		Model 3f	
	<i>b</i> (<i>SE</i>)	95% CI	<i>b</i> (<i>SE</i>)	95% CI	<i>b</i> (<i>SE</i>)	95% CI	<i>b</i> (<i>SE</i>)	95% CI	<i>b</i> (<i>SE</i>)	95% CI
Psychopathy	.01 (.01)	[<.01, .02]	<.01 (<.01)	[−.01, .01]	−.01(.01)	[<.01, .02]	<.01 (<.01)	[−.01, .01]	<.01 (<.01)	[−.01, 0.01]
Interaction	<.01* (<.01)	[−.01, <.01]	<.01 (<.01)	[<.01, <.01]	<.01 (<.01)	[<.01, <.01]	<.01 (<.01)	[<.01, .01]	<.01 (<.01)	[<.01, .01]
PPU	<.01 (<.01)	[<.01, .01]	<.01* (<.01)	[<.01, .01]	<.01* (<.01)	[<.01, .01]	<.01 (<.01)	[<.01, .01]	<.01* (<.01)	[<.01, .01]
IE	.49* (.15)	[.13, .72]	.52* (.15)	[.16, .77]	.50* (.14)	[.14, .74]	.51* (.15)	[.15, .76]	.51* (.15)	[.15, .77]
Female	−.04 (.04)	[−.13, .03]	−.03 (.04)	[−.11, .05]	−.03 (.04)	[−.11, .05]	−.05 (.04)	[−.14, .04]	−.05 (.05)	[−.14, .04]
Non-binary	−.01 (.09)	[−.16, .18]	.02 (.09)	[−.14, .22]	.01 (.09)	[−.14, .21]	<.01 (.09)	[−.15, .19]	−.01 (.09)	[−.16, .20]
13–16 years	−.07 (.05)	[−.15, .02]	−.07 (.05)	[−.16, .02]	−.06 (.05)	[−.15, .03]	−.06 (.05)	[−.15, .03]	−.06 (.05)	[−.15, .04]
> 16 years	−.09* (.04)	[−.18, −.01]	−.09* (.04)	[−.17, <.01]	−.09* (.04)	[<.01, .01]	−.08 (.04)	[−.17, <.01]	−.08 (.04)	[−.17, .01]

Note. *N* = 313. CI = 95% bias-corrected and accelerated confidence interval based on 5,000 samples; PPU = problematic pornography use; IE = illegal escalation. Gender and age at first pornography use were covariates. The reference category for gender was male. The 13–16 years and >16 years categories refer to age at first use (reference category = 9–12 years). * indicates that the confidence interval does not include zero ($\alpha = .05$).

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Table B2

Bootstrap OLS Regressions (PROCESS) Using SUPPS-P Subscales to Predict Illegal Escalation

Variable	Model 4b		Model 4c		Model 4d		Model 4e		Model 4f	
	<i>b</i> (<i>SE</i>)	95% CI	<i>b</i> (<i>SE</i>)	95% CI	<i>b</i> (<i>SE</i>)	95% CI	<i>b</i> (<i>SE</i>)	95% CI	<i>b</i> (<i>SE</i>)	95% CI
Constant	.02 (.04)	[−.07, 0.10]	.03 (.05)	[−0.08, .11]	.02 (.04)	[−.08, .10]	.02 (.05)	[−.08, .11]	.03 (.04)	[−.07, .10]
Sensation Seeking	<.01 (.01)	[−.01, 0.01]	—	—	—	—	—	—	—	—
Negative Urgency	—	—	<.01 (.01)	[−0.009, 0.013]	—	—	—	—	—	—
Positive Urgency	—	—	—	—	<.01 (.01)	[−.01, .01]	—	—	—	—
Lack of Perseverance	—	—	—	—	—	—	−.01 (.01)	[−.03, .01]	—	—
Lack of Premeditation	—	—	—	—	—	—	—	—	<.01 (.01)	[−.01, .01]
Psychopathy	<.01 (.01)	[−.01, .01]	<.01 (<.01)	[−.01, .01]	<.01 (.01)	[−.01, .01]	<.01 (.01)	[−.01, .01]	<.01 (.01)	[−.01, .01]

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Variable	Model 4b		Model 4c		Model 4d		Model 4e		Model 4f	
	<i>b</i> (<i>SE</i>)	95% CI	<i>b</i> (<i>SE</i>)	95% CI	<i>b</i> (<i>SE</i>)	95% CI	<i>b</i> (<i>SE</i>)	95% CI	<i>b</i> (<i>SE</i>)	95% CI
Interaction	<.01 (<.01)	[<.01, <.01]	<.01 (<.01)	[<.01, <.01]	<.01 (<.01)	[<.01, <.01]	<.01 (<.01)	[<.01, <.01]	<.01 (.01)	[<.01, <.01]
PPU	<.01 (<.01)	[<.01, <.01]	<.01 (<.01)	[<.01, <.01]	<.01 (<.01)	[<.01, <.01]	<.01 (<.01)	[<.01, <.01]	<.01 (.01)	[<.01, <.01]
TE	.28* (.16)	[.01, .60]	.28* (.15)	[.03, .58]	.28* (.15)	[.03, .59]	.28* (.15)	[.03, .59]	.28* (.15)	[.03, .59]

Note. *N* = 321. CI = 95% bias-corrected and accelerated confidence interval based on 5,000 samples; PPU = problematic pornography use; TE = taboo escalation. * indicates that the confidence interval does not include zero ($\alpha = .05$).