Master Thesis

Behind the Screen: The Risk Factors Driving Child Sexual Abuse Material Consumption

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Abstract

The fast development of the internet has made Child Sexual Abuse Material (CSAM) increasingly accessible and shareable, creating a problem that exceeds law enforcement capabilities. This study investigates two psychological risk factors that contribute to escalated pornography use, a pattern that can increase vulnerability to consuming CSAM. More specifically, it examines the role of sensation seeking and self-control. The study was conducted through an online survey with male participants ($N = 126$) aged 18 to 30. After computing the total escalation score, the usable sample consisted of 56 participants. Participants completed scales measuring sexual sensation seeking, self-control and escalated pornography use. The results showed that sensation seeking and self-control did not independently predict escalation. However, an interaction was found, which suggests that the effect of sensation seeking on pornography escalation depends on an individual's level of self-control. The results refine existing models of online sexual behaviour by emphasising the conditional nature of personality effects and the protective role of self-control.

Keywords: CSAM, escalation, sensation seeking, self-control, prevention, risk factors.

Behind the Screen: The Risk Factors driving CSAM Consumption

Child Sexual Abuse Material (CSAM) refers to any content that depicts sexually explicit conduct involving a person under the age of 18 (Seto et al., 2015). This includes a wide range of materials, such as images, videos, and other media that exploit minors. While the true prevalence of CSAM remains difficult to estimate due to the hidden and underreported nature of distribution, the number of reported incidents has risen sharply. For instance, reports increased from 565,000 between 1998 and 2008 to 9.6 million in 2017 alone (Bursztein et al., 2019). According to the National Center for Missing and Exploited Children (NCMEC, 2023), over 36 million suspected cases of child sexual exploitation have been submitted to the CyberTipline, along with more than 105 million CSAM-related files.

The rapid expansion of the internet has made CSAM widely accessible and difficult to control. Anonymous, decentralised platforms, encrypted networks, and peer-to-peer systems allow perpetrators to share material with limited risk of detection, stretching law enforcement resources beyond capacity (ICMEC, 2018; Steel et al., 2020). Beyond the gratification of deviant sexual interests, the production and circulation of CSAM have become increasingly driven by financial incentives. The combination of low production costs, high global demand, and inadequate international enforcement has turned CSAM into a highly profitable illicit market, adding further complexity to detection and prosecution (Europol, 2022). As a result, the scale of CSAM has created a persistent enforcement gap, where detection and prosecution efforts cannot keep pace with the production and distribution (Bissias et al., 2016; Burztein et al., 2019). This gap shows the critical importance of prevention initiatives. To develop effective prevention strategies, it is essential to study the risk factors that may lead to the consumption of CSAM. A key component of preventing and reducing CSAM offending is understanding the behaviours of individuals who consume such material, including the risk

factors and pathways that contribute to its use and potential progression into further offending.

Most identified victims are prepubescent or younger (67%). In recent years, the prevalence of material involving penetrative acts between adults and children has escalated, as has the overall severity of depicted abuse (NCMEC, 2023). Research suggests that this may reflect a psychological process known as desensitisation, in which repeated exposure to explicit material diminishes arousal responses, leading some users to seek more extreme or taboo content to achieve the same level of stimulation (Seto, 2013; Quayle & Taylor, 2004).

The consumption and circulation of CSAM contribute to ongoing and severe harm to victims. Many victims exhibit significant psychological symptoms at some stage in their lives (Hornor, 2010). Child sexual abuse has been associated with sexualised behaviours in children, as well as a range of psychiatric disorders that can manifest in both childhood and adulthood. They have heightened risks of PTSD (Steine et al., 2017, depression (Mullers & Downing, 2008), substance abuse, and heightened suicide risk (Dube et al., 2001).

Pathways to offending

A common assumption is that individuals who view CSAM are necessarily sexually attracted to children. While this is true for some offenders, research shows that this group is highly heterogeneous: many offenders do not display a fixed sexual preference for children, and a substantial proportion do not meet diagnostic criteria for paedophilia (Babchishin et al., 2015). Instead, recent research suggests that curiosity, thrill-seeking, and even accidental exposure have become increasingly common pathways (Huikiri, 2023). Crucially, opportunity plays a central role in shaping behaviour. Hunn et al. (2020) found that situational and contextual factors, such as anonymity, accessibility, and a lack of perceived consequences, can be more influential than pre-existing sexual interest in children when it comes to initial CSAM consumption.

This situational model also helps explain why some individuals escalate from legal to illegal material. Research on pornography consumption suggests that repeated exposure can trigger desensitisation: a psychological process whereby repeated exposure to a certain stimulus reduces emotional responsiveness (Seto, 2013). Over time, individuals may require increasingly extreme material to achieve the same level of arousal (Knack et al., 2020). Offenders themselves have also described this trajectory. For instance, the majority of convicted CSAM offenders (92%) reported starting with legal or "barely legal" pornography (featuring individuals who appear young) before gradually transitioning to CSAM (Wortley et al., 2024). Others initially encountered CSAM unintentionally but continued viewing it, reinforcing the idea that escalation does not always stem from a fixed deviant preference but from patterns of increasingly risky consumption.

Further studies support this finding, showing that offenders often progress through increasingly violent or extreme material before turning to CSAM (Quayle & Taylor, 2003; Seto, 2013). Over time, compulsive use and emotional detachment from the content may lead individuals to further normalise CSAM consumption, with offenders justifying their behaviour (Ince et al., 2023). Taken together, these findings illustrate that pathways into CSAM are not always rooted in enduring sexual interests in children but can also emerge from situational opportunity, curiosity, and the escalation of habitual pornography use.

Some individuals may be more susceptible to these pathways than others. Certain personality traits may increase the likelihood of escalation of pornography use. For instance, those who become bored more easily and seek higher levels of arousal could be more vulnerable to consuming CSAM, as they become desensitised to conventional pornography over time and seek out more extreme or taboo content to achieve the same level of stimulation.

Sensation Seeking

Sensation seeking, and especially sexual sensation seeking, has been identified as a significant risk factor for CSAM consumption (Ray et al., 2014; Napier, 2022). Sexual sensation seeking refers to the tendency to pursue novel and intense sexual experiences, even when they involve significant risk (Kalichman & Rompa, 1995). Because individuals high in sensation seeking are driven to seek stronger stimuli, they are more likely to engage in behaviours that deviate from social or legal norms (Ray et al., 2014). In this context, CSAM may be a highly prohibited and therefore arousing form of content for these individuals.

Research has shown that individuals high in sensation seeking tend to spend more time viewing pornography (Napier, 2022) and this extended exposure increases the likelihood of desensitisation, the process by which conventional material loses its arousing effect, pushing individuals to seek out more extreme content. This escalation aligns with a core motivation behind sensation seeking: a drive to overcome habituation by constantly seeking stronger stimuli (Zuckerman, 2007). This mechanism mirrors the escalation pathway discussed earlier: just as repeated exposure to adult pornography can foster a shift toward illegal material, sensation seeking amplifies this progression by creating a stronger drive to overcome habituation.

These tendencies are consistent with broader findings linking sensation seeking to other forms of risky or criminal behaviours, such as substance abuse, impulsive sexual behaviour, and criminal activity (Dickson et al., 2018; Pfefferbaum & Wood, 1994).

Altogether, this suggests that individuals high in sensation seeking may be especially vulnerable to escalation in online environments where barriers to access are low. Recognising this vulnerability is essential for understanding the psychological processes that contribute to CSAM consumption.

Self-Control

Low self-control is another factor linked to a wide range of criminal behaviour, including online sexual offending and pornography consumption (Clevenger et al., 2014; Buzzell et al., 2006). Research has also shown strong links between low self-control and various forms of criminal activity, such as property offences (Delisi, 2001), homicide (Piquero et al., 2005), and sexual offending (Clevenger et al., 2016). Individuals with low self-control are characterised by impulsivity, risk-taking, and a lack of consideration for long-term consequences, making them more prone to act on immediate temptations (Hirshi & Gottfredsen, 2017).

In the online environment, where CSAM is accessible, anonymous, and perceived as low risk, these tendencies may be particularly relevant. Research indicates that low self-control is associated with higher engagement in pornography use (Buzzell et al., 2006) and plays a central role in problematic pornography use (Okabe & Ito, 2022). Studies comparing online and contact sexual offenders also highlight impulsivity as a key characteristic of those who engage with CSAM (Babchishin et al., 2015).

CSAM offending can be reduced when effective barriers are in place, as self-control functions as a psychological "brake" on risky behaviour (Insoll et al., 2024). When self-control is low, these internal brakes are weak, meaning that external safeguards become especially important. Understanding the role of self-control therefore provides insight into how individual traits interact with situational opportunities online, shaping the likelihood of escalation and offending behaviour.

The present study

Given the rapid growth of CSAM consumption and its profound impact on victims (Hornor, 2010), this study aims to identify risk factors associated with escalated pornography use. Specifically, the study examines the roles of sensation-seeking and self-control in

predicting escalated pornography use. The central research question is: To what extent are sensation seeking and self-control associated with escalated pornography use?

The study focuses on men between the ages of 18 and 30, as previous research has consistently shown that men are more likely than women to consume pornography (Hald, 2006) and to engage in problematic or escalating pornography use (Wright et al., 2013). Men also represent the majority of individuals convicted of CSAM-related offenses (Seto et al., 2011), which makes them a particularly relevant group for investigating risk factors. The chosen age range captures young adults. This group reports the highest rates of pornography use compared to older groups (Wright et al., 2013) and escalation patterns are more commonly reported in this age group (Häggström-Nordin et al., 2009). Furthermore, this stage of life is linked to increased level of risk-taking and stronger sensation-seeking drives (Steinberg, 2010; Zuckerman, 2007). During this period, individuals also show greater impulsivity and weaker self-regulatory abilities than in later adulthood (Casey et al., 2008), making it an especially relevant group for examining how sensation seeking and self-control contribute to pornography escalation.

The following hypotheses are proposed:

Hypothesis 1: Higher levels of sensation seeking are positively associated with escalated pornography use.

Hypothesis 2: Higher levels of self-control are negatively associated with escalated pornography use.

Hypothesis 3: Self-control moderates the positive relationship between sensation seeking and escalated pornography use, such that this relationship will be stronger among individuals with lower levels of self-control.

Understanding these dynamics will provide a foundation for developing prevention strategies to reduce CSAM consumption.

Method

Participants

Before the start of the study, the study received ethical approval from the Erasmus University in Rotterdam. The initial sample consisted of $N = 252$ participants. Participants were removed from the data when they did not meet the criteria for the study (male, 18-30 years) or if they filled out less than 70 percent of the questionnaire. There were 52 participants deleted, because they were not male. Another 5 participants were deleted because they did not meet the age criteria. Finally, 69 participants were deleted because they filled out less than 70 percent of the questionnaire. After checking the data, the final sample was reduced to $N = 126$ male participants aged 18 to 30 years old ($M = 22.34$, $SD = 2.79$) who watch online pornography.

Most participants identified as heterosexual ($n = 102$, 80.9%) and single ($n = 70$, 55.7%). The participants were recruited through social contacts of the researcher and master students working on this project. Furthermore, flyers with a QR-code were handed out at the university campus to recruit participants. The social media platform Instagram was also used to recruit participants. Additionally, the questionnaire was posted on the Erasmus University participant pool system. When students completed the survey, they received course credit.

Measures

Sexual Sensation Seeking Scale (SSSS)

The SSSS (Kalichman & Rompa, 1995) was used to measure the independent variable sensation seeking. Participants were instructed to indicate the extent to which each statement described them. The scale contains 10 items and participants were asked to respond using four-point scales, ranging from 1 (Not at all like me) to 4 (Totally like me), with intermediate options labelled 2 (Slightly like me) and 3 (Mainly like me). Examples of statements in this questionnaire are: “When it comes to sex, physical sensation is more important to me than

how well I know the person" and "I am interested in trying out new sexual experiences". The items were combined to generate a total score, with a higher score indicating a higher level of sensation-seeking. In this study, the Cronbach's alpha was .81.

Brief Self Control Scale (BSCS)

The independent variable self-control was measured with BSCS (Tangney et al., 2004). Participants were instructed to reflect on their typical behaviours and indicate how well each statement applied to them. The BSCS contains 13 items, which are rated on a 5-point scale ranging from 1 (Not at all like me) to 5 (Very much like me). Some of the statements included in this questionnaire are: "I am good at resisting temptation" and "I often act without thinking about the consequences". After reverse scoring the appropriate items, the items were added to create a total score, where a higher score indicates a higher level of self-control. In this study, the Cronbach's alpha was .79.

Pornography Consumption Questionnaire (PCQ)

The dependent variable escalated pornography use was assessed using a modified version of the PCQ (Hald, 2006). This instrument involves questions regarding themes or activities participants typically view and themes or activities they find arousing. This part of the questionnaire contains 20 items, which are rated on a 5-point scale, labelled as: 1 (Never), 2 (Rarely), 3 (Sometimes), 4 (Often), and 5 (Always). Examples of items that are included are: sex with people >18, sex with children, heterosexual content, and violent sex. Participants who reported viewing content they did not find arousing were categorised as engaging in escalated pornography use. For each category, an escalation score was computed by subtracting the arousal score from the viewing score. Positive values indicated that participants viewed material they did not find arousing. These scores were summed to create an overall escalation score, where higher values reflect greater escalation.

Procedure

This study was performed through an online survey. The participants accessed the survey in Qualtrics, an online survey tool, via an anonymous link. They provided informed consent before proceeding to view the questionnaires in randomised order. The participants were informed about the anonymous nature of the survey. They were also informed that they could withdraw from the study at any time. After they completed the survey, they were provided with a debriefing and contact information for support agencies.

Planned Data Processing and Statistical Analyses

First, the following assumptions were assessed:

1. Linearity, this was checked using a residual plot.
2. Homoscedasticity, this was checked using a residual plot.
3. Multicollinearity, this was assessed by examining the correlations among the predictors.
4. Normality, this was evaluated through a histogram of the residuals.

Power analyses were performed using G*power software to evaluate the necessary sample size required to detect a statistically significant effect. Assuming an alpha level of .05 and a power of .80, and a medium effect size ($f^2 = .15$, Cohen, 1988) for a multiple regression analysis with two predictors, the calculated sufficient sample was 107.

All statistical analyses were conducted using the Statistical Package for Social Sciences (SPSS) version 29. For the first and second hypothesis, it was expected that higher levels of sensation seeking and lower levels of self-control would each independently predict higher levels of escalated pornography use. To test these hypotheses, a multiple linear regression was conducted with sensation seeking and self-control as independent variables and escalated pornography use as the dependent variable. For the third hypothesis, it was expected that self-control moderates the relationship between sensation seeking and escalated pornography use, such that this relationship will be stronger among individuals with lower levels of self-control. The moderation was tested with the regression analysis Hayes

PROCESS macro (Model 1), where sensation seeking was entered as the independent variable, escalation of pornography use was entered as the dependent variable, and self-control was entered as the moderator.

Results

Assumptions

During data processing, the creation of the total escalation score reduced the sample size ($N = 56$) due to missing responses on one or more escalation items.

To test the assumption of normality, a residual plot was used, which showed no serious deviation from the assumption of normality. In addition, an assumption check for linearity and heteroscedasticity through a residual-by-predicted-values plot was performed and both assumptions were met as well. During data screening processing, participants 6, 7, and 31 were excluded due to repetitive response patterns. The variance inflation factors (VIF) indicated no multicollinearity.

Descriptives

The escalation variable had a minimum score of -8 and a maximum score of 10 ($M = -0.62$, $SD = 3.68$). The variable sensation seeking ranged from 12 to 40 ($M = 23.19$, $SD = 5.68$) and the variable self-control had a minimum score of 16 and a maximum score of 60 ($M = 41.05$, $SD = 6.05$). No significant correlations were found between the variables (see Table 1).

Table 2 presents the number and percentage of participants who reported escalation in pornography use across different content categories. The most frequent categories of escalation were vaginal penetration (27.4%), oral sex (24.2%), and heterosexual content (22.7%).

Table 1.

Means, Standard Deviations, and Correlations between the Variables

	M	*SD*	*1*	*2*	*3*
1. Escalation	-0.62	3.68	-	-.15	.01
2. Sensation Seeking	3.68	5.68	-.15	-	.17
3. Self-Control	41.05	6.05	.01	.17	-

*Note. *p < .05*

Table 2.

Escalation of Pornography Use per Category

Category	N	% Escalated pornography use
Vaginal penetration	35	27.4
Anal penetration	14	11
Hentai	5	3.9
Oral sex	31	24.2
Rape	5	3.9
Sex with animals	2	1.6
Sex under 18	1	0.8
Sex with children	1	0.8

Snuff	2	1.6
Heterosexual	29	22.7
Lesbian content	7	5.5
Gay male content	7	5.5
Fetish	13	10.2
Teens	19	14.9
Group sex	14	11
Violent sex	14	11
Bukkake	5	3.9
Sex involving urine	6	4.7
Other	3	2.4

Note. N = number of participants who reported escalation

Hypothesis testing

A multiple regression analysis was conducted to examine whether sensation seeking and self-control predicted escalation. The overall model was not significant, $F(2, 53) = 0.67$, $p = .52$, with an R^2 of .03, indicating that the predictors explained 2.5% of the variance in escalation. Individually, self-control did not predict escalation ($B = 0.02$, $SE = 0.08$, $\beta = .03$, $t(53) = 0.23$, $p = .82$). Similarly, sensation seeking was not a significant predictor, $B = –0.10$,

SE = 0.09, β = –.16, *t*(53) = –1.16, *p* = .25. Together, these findings suggest that sensation seeking and self-control on their own were not significant predictors of escalation.

Next, we aimed to test the moderating effect of self-control on the relationship between sensation seeking and escalated pornography use, such that the positive relationship between sensation seeking and escalated pornography viewing will be stronger when individuals have lower levels of self-control, compared to when self-control is high. To test this hypothesis, a moderation analysis was conducted using PROCESS Model 1. The overall model was not significant (R^2 = .11, *F*(3, 52) = 2.18, *p* =.10). However, the interaction term was significant (*b* = -0.03, *t*(52) = -2.25, *p* = .03), indicating that the effect of sensation seeking on escalation depended on an individual's level of self-control (see Table 3).

Table 3.

Main effects and Moderation Effect between Variables

	B	*SE*	*t*	*p*	*95% CI*
Constant	0.99	3.74	0.26	0.79	[-47.94, 0.94]
Sensation Seeking	-0.1	0.09	-1.16	0.25	[0.15, 2.16]
Self-Control	0.02	0.08	0.23	0.82	[0.07, 1.24]
Sensation Seeking x Self-Control	-0.03	0.01	-2.25	0.03	[0.06, < 0.00]

Discussion

This study aimed to investigate the roles of sensation seeking and self-control in predicting escalated pornography use among young adult men. Contrary to our expectations, the results revealed that sensation seeking and self-control did not independently predict escalation. However, an interaction was found between the variables, indicating that the effect of sensation seeking on escalated pornography use depends on an individual's level of

self-control. Specifically, this suggests that high sensation seeking is associated with greater escalation when self-control is low, whereas strong self-control appears to buffer against this effect.

It was unexpected that no positive relationship was found between sensation seeking and escalation of pornography use, given that prior research linked sensation seeking to increased pornography use, risk-taking, and sexual novelty seeking (Ray et al., 2014; Napier, 2022). The moderation pattern highlights that sensation seeking might not operate in isolation but is shaped by an individual's self-regulatory capacity. So, whether their motivation to seek novel experiences leads to this behaviour depends on their ability to regulate these impulses. This interpretation aligns with the Reward Threshold Theory (Zuckerman, 2007), which suggests that individuals differ in how much stimulation they need to feel aroused or excited. High sensation seekers have higher thresholds for stimulation, meaning they require more intense experiences to maintain interest. When such individuals have strong self-control, they can regulate their impulses and may choose to disengage from pornography once it becomes less stimulating. However, when self-control is weak this same drive for stronger stimulation may lead them to escalate their pornography use, turning to increasingly extreme or taboo content to achieve the desired level of excitement.

Taken together, this finding underscores that escalation risk arises not from sensation seeking alone but from the interaction between motivational drives and regulatory capacities. This supports dual-process models of behaviour (Steinberg, 2010), which propose that risk behaviour results from an imbalance between heightened reward sensitivity and underdeveloped self-regulatory systems. This interaction is particularly relevant for understanding pornography escalation as a potential pathway toward the consumption of illegal sexual material such as CSAM. Desensitisation processes may make conventional sexual material less arousing over time, this could encourage individuals, especially those

high in sensation seeking, to explore increasingly extreme or prohibited content (Seto, 2013). In this context, low self-control functions as a psychological vulnerability, reducing the ability to resist this progression. Recognising how self-control moderates this process helps identify psychological risk factors that may contribute to the transition from legal to illegal sexual content.

Another possible explanation is that individuals high in sensation seeking may fulfil their need for novelty and arousal through offline sexual activities or diverse sexual experiences, rather than relying on pornography. These offline activities may reduce their motivation to escalate in their pornography use. This interpretation aligns with research by Kalichman and Rompa (1995), who showed that sexual sensation seeking is associated with greater willingness to engage in real-life sexual behaviours.

The lack of a significant relationship between self-control alone and escalation of pornography use is also noteworthy. Prior studies have consistently linked low self-control to compulsive or problematic pornography use, where individuals struggle to regulate their behaviour despite experiencing negative consequences (Buzzell et al., 2006; Okabe & Ito, 2022). This finding suggests that low self-control may not independently drive escalation when it occurs in a more exploratory or curiosity-driven context. The operationalisation of escalation of pornography use in this study, defined as viewing pornography that the participant did not typically find arousing, may reflect a different psychological process. Rather than reflecting a loss of control, this type of escalation is more consistent with curiosity-driven exploration, in which individuals experiment with unfamiliar or taboo content out of novelty-seeking or situational opportunity.

This distinction is important, as it may explain why self-control predicted escalation only in interaction with sensation seeking. Compulsive escalation and exploratory escalation likely have different underlying mechanisms. Compulsive escalation is often tied to

impulsivity and low self-regulation (Laier & Brand, 2014), whereas exploratory escalation may reflect experimentation in anonymous environments where individuals feel free to sample categories outside their usual preferences (Grubbs et al., 2019). In this light, when low self-control and strong novelty-seeking tendencies coincide, the boundary between exploration and compulsion may blur, facilitating a gradual transition from exploratory behaviour to more compulsive or risky patterns of use.

It is also important to consider the relationship between sensation seeking and self-control themselves. Developmental theories often suggest that these traits are related to each other, with high sensation seeking coinciding with low self-control (Steinberg, 2010). From this perspective, individuals who seek intense stimulation are thought to be less able to inhibit impulsive behaviours, creating a double risk for engaging in problematic activities. However, in this study sensation seeking and self-control were not significantly correlated. This finding challenges the assumption that these traits are universally linked. The two traits capture two different psychological processes: sensation seeking reflects a drive to pursue arousing experiences, whereas self-control reflects the capacity to inhibit immediate impulses in favor of long-term goals. The lack of correlation in this study may indicate young adults can be high in novelty-seeking without necessarily lacking regulatory abilities, or vice versa.

Limitations

These findings should be interpreted with caution considering several methodological limitations. First, the relatively small sample size may have limited the statistical power and the stability of the moderation effect. Moderation effects typically require larger samples to be identified reliably (Aguinis et al., 2005), and small samples can inflate or obscure true relationships. In addition, the usable sample size for the analyses was reduced to 56, further decreasing power.

Second, this study relied on self-report data, which makes this research vulnerable to social desirability bias. Even though anonymity was assured, participants may have underreported engagement with taboo pornography categories. Such underreporting could have led to an underestimation of escalation and weakened associations with personality traits. Moreover, if responses reflect perceived social norms rather than actual behaviours, this introduces systematic bias that complicates the interpretation of results.

Another limitation relates to the way the escalation variable was constructed. By combining all escalation scores across different content categories into one overall score, the measure may have masked important variations between types of content. For example, a participant who escalated strongly in one category but not in others would be averaged out, potentially giving the impression of no escalation when, in reality, escalation occurred in specific domains.

Finally, the operationalisation of escalation in this study, defined as pornography that participants did not typically find arousing, captures only one aspect of the broader construct. This definition may primarily reflect curiosity-based or exploratory escalation rather than compulsive use. As such, the measure may have been less sensitive to self-regulatory deficits or addictive patterns that other conceptualisations of escalation include.

Future research

The findings of this study offer multiple directions for future research. First, the moderation finding underscores the need to move beyond simple trait-based models and towards interactional frameworks that consider how psychological and contextual factors combine to influence behaviour. Future studies could explore additional moderators. For example, moral disengagement has been linked to the justification of harmful or socially unacceptable behaviours (Bandura, 1999). Applied to pornography use, it may explain how individuals rationalise consuming material they do not initially find arousing, and thereby

allowing escalation to continue (Knack et al., 2020). Online disinhibition describes the reduced self-restraint individuals experience in anonymous online environments (Suler, 2004) and could help explain why some people experiment with taboo categories in ways they would not offline. Finally, emotional dysregulation may be relevant, as individuals who struggle to regulate negative emotions sometimes turn to pornography as a coping mechanism, which could potentially foster escalation when conventional material fails to provide sufficient relief (Testa et al., 2024).

Furthermore, future research should try to distinguish between different types of escalation. Distinguishing between curiosity-based, compulsive, and moral-incongruence-based escalation is essential, as these may be driven by different mechanisms and require different prevention strategies. For example, curiosity-based escalation may be situational and linked to experimentation, whereas compulsive escalation is more likely linked to low self-control and addictive processes. In addition, future research should also examine category-specific escalation patterns, as combining all content types into a single score may obscure meaningful differences between them.

Additionally, future studies could explore how situational influences impact escalation. For example, it should be investigated how platform design features encourage gradual exposure to more extreme material. This would help clarify how opportunity structures and online environments interact with individual characteristics to shape escalation trajectories.

Finally, methodological improvements are needed to advance this area of research. In the present study, escalation was defined narrowly even though escalation is likely multifaceted. Future studies should therefore develop multidimensional measures that also assess frequency, intensity, motivations, and emotional consequences. In addition, qualitative methods, such as interviews, could provide a richer insight into how individuals themselves

experience escalation. Longitudinal designs would also be valuable and would help clarify whether escalation represents a temporary phase of experimentation or develops into a persistent behavioural pattern.

Practical implications

Although the findings of this study should be considered with caution, they may offer initial insights for prevention efforts. The moderation effect suggests that escalation risk is highest when high sensation seeking coincides with low self-control, suggesting that prevention should address both motivations and regulatory factors.

Educational initiatives could help young adults understand how the combination of strong novelty-seeking and low self-control can increase vulnerability to escalation of pornography use. Awareness campaigns could also inform young adults about the potential for desensitisation, where repeated exposure to sexual content may gradually shift viewing habits. In addition, interventions focused on strengthening self-regulatory skills, such as impulse-control or emotional regulation training, may reduce vulnerability among high sensation seekers by enhancing their ability to manage impulses and emotional triggers.

Finally, an important implication lies in digital platform design. If pornography escalation is partly fuelled by situational opportunities, platform features such as autoplay or algorithmic recommendations may unintentionally promote exposure to more extreme material. Policymakers and developers could explore safeguards to reduce the likelihood of escalation by introducing features that disrupt binge-like use and provide warnings when content becomes progressively more extreme.

Conclusion

Sensation seeking and self-control did not independently predict escalation, but their interaction revealed a theoretically meaningful pattern. These findings provide nuance to existing literature by showing that the effect of sensation seeking on pornography escalation

depends on an individual's level of self-control. This raises the question of whether similar conditional relationships may also exist for other personality traits.

While these results provide valuable insights, they should be interpreted with caution given the methodological limitations of the present study. Future research with larger samples is needed to replicate and expand these findings. Nevertheless, understanding the interplay between sensation seeking and self-control offers a promising framework for both theoretical development and prevention efforts. Deepening our understanding of the processes that drive the escalation of pornography remains essential for developing interventions aimed at reducing harmful consumption, including CSAM.

References

Aguinis, H., Beaty, J. C., Boik, R. J., & Pierce, C. A. (2005). Effect size and power in assessing moderating effects of categorical variables using multiple regression: a 30-year review. *The Journal of applied psychology*, *90*(1), 94–107. https://doi.org/10.1037/0021-9010.90.1.94

Altikriti, S., Theocharidou, K., & Sullivan, C. J. (2020). Specific theories of crime? A longitudinal assessment of the competing effects of psychopathy and self-control. *Journal of Crime & Justice/Journal of Crime and Justice*, *43*(5), 547–567. https://doi.org/10.1080/0735648x.2020.1727765

Babchishin, K. M., Hanson, R. K., & VanZuylen, H. (2015). Online child pornography offenders are different: a meta-analysis of the characteristics of online and offline sex offenders against children. *Archives of sexual behavior*, *44*(1), 45–66. https://doi.org/10.1007/s10508-014-0270-x

Bailey, A., Allen, L., Stevens, E., Dervley, R., Findlater, D., & Wefers, S. (2022). Pathways and prevention for indecent images of children offending: A qualitative study. *Sexual Offending Theory Research and Prevention*, *17*. https://doi.org/10.5964/sotrap.6657

Bandura, A. (1999). Moral disengagement in the perpetration of inhumanities. *Personality and Social Psychology Review, 3*(3), 193–209. https://doi.org/10.1207/s15327957pspr0303_3

Bursztein, E., Clarke, E., DeLaune, M., Elifff, D. M., Hsu, N., Olson, L., Shehan, J., Thakur, M., Thomas, K., & Bright, T. (2019). Rethinking the Detection of Child Sexual Abuse Imagery on the Internet. *Aggression and Violent Behavior*, *26*, 16-25. https://doi.org/10.1145/3308558.3313482

Buzzell, T., Foss, D., & Middleton, Z. (2006). Explaining use of online pornography: A test of self-control theory and opportunities for deviance. *Journal of Criminal Justice and Popular Culture*, 13 (2), 96-116.

Casey, B. J., Getz, S., & Galván, A. (2008). The adolescent brain. *Developmental Review, 28*(1), 62–77. https://doi.org/10.1016/j.dr.2007.08.003

Clevenger, S., Navarro, J. N., & Jasinski, J. L. (2016). A Matter of Low Self-Control? Exploring differences between Child Pornography Possessors and Child Pornography Producers/Distributers using Self-Control Theory. *Sexual Abuse*, *28*(6), 555–571. https://doi.org/10.1177/1079063214557173

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.

Dickson, P. E., Roy, T. A., McNaughton, K. A., Wilcox, T. D., Kumar, P., & Chesler, E. J. (2018). Systems genetics of sensation seeking. *Genes Brain & Behavior*, *18*(3). https://doi.org/10.1111/gbb.12519

Dube, S. R., Anda, R. F., Felitti, V. J., Chapman, D. P., Williamson, D. F., & Giles, W. H. (2001). Childhood abuse, household dysfunction, and the risk of attempted suicide throughout the life span. *JAMA*, *286*(24), 3089. https://doi.org/10.1001/jama.286.24.3089

Filipas, H. H., & Ullman, S. E. (2006). Child sexual Abuse, coping responses, Self-Blame, Posttraumatic Stress Disorder, and adult sexual revictimization. *Journal of Interpersonal Violence*, *21*(5), 652–672. https://doi.org/10.1177/0886260506286879

Grubbs, J. B., Perry, S. L., Wilt, J. A., & Reid, R. C. (2018**).** Pornography problems due to moral incongruence: An integrative model with a systematic review and meta-analysis. *Archives of Sexual Behavior, 47*(7), 1849–1870. https://doi.org/10.1007/s10508-018-1248-x

Hald, G. M. (2006). Gender Differences in Pornography Consumption among Young Heterosexual Danish Adults. *Archives of Sexual Behavior*, *35*(5), 577–585. https://doi.org/10.1007/s10508-006-9064-0

Häggström-Nordin, E., Hanson, U., & Tydén, T. (2009). Associations between pornography consumption and sexual practices among adolescents in Sweden. *International Journal of STD & AIDS, 20*(2), 102–107. https://doi.org/10.1258/ijsa.2008.008279

Hornor, G. (2010). Child sexual abuse: Consequences and implications. *Journal of Pediatric Health Care*, *24*(6), 358–364. https://doi.org/10.1016/j.pedhc.2009.07.003

Hoyle, R. H., Stephenson, M. T., Palmgreen, P., Lorch, E. P., & Donohew, R. L. (2002). Reliability and validity of a brief measure of sensation seeking. *Personality and Individual Differences*, *32*(3), 401–414. https://doi.org/10.1016/s0191-8869(01)00032-0

Hirschi, T., & Gottfredson, M. R. (2017). The generality of deviance. In *RoutledgeBooks* (pp. 203–220). https://doi.org/10.4324/9781315131511-15

Huikuri, S. (2023). Users of online child sexual abuse material. *Journal of Police and Criminal Psychology*, *38*(4), 904–913. https://doi.org/10.1007/s11896-023-09611-4

Hunn, C., Spiranovic, C., Prichard, J., & Gelb, K. (2020). Why internet users' perceptions of viewing child exploitation material matter for prevention policies. *Australian and New Zealand Journal of Criminology/Australian & New Zealand Journal of Criminology*, *53*(2), 174–193. https://doi.org/10.1177/0004865820903794

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/s41598-023-45459-8

Insoll, T., Ovaska, A. K., & Vaaranen-Valkonen, N. (2021). CSAM users in the dark web: Protecting children through prevention (ReDirection Survey Report). Suojellaan Lapsia ry. https://www.suojellaanlapsia.fi/en/post/csam-users-in-the-dark-web-protecting-children-through-prevention

Insoll, T., Ovaska, A. K., Nurmi, J., Aaltonen, M., & Vaaranen-Valkonen, N. (2022). Risk factors for child sexual abuse material users contacting children online. *Journal of Online Trust and Safety*, *1*(2). https://doi.org/10.54501/jots.v1i2.29

International Centre for Missing & Exploited Children (ICMEC), 2018. Child sexual abuse material: model legislation & global review.

Iversen, H. H., & Rundmo, T. (2002). Personality, risky driving and accident involvement among Norwegian drivers. *Personality and Individual Differences*, *33*(8), 1251–1263. https://doi.org/10.1016/s0191-8869(02)00010-7

Kalichman, S. C., & Rompa, D. (1995). Sexual Sensation seeking and Sexual Compulsivity Scales: Validity, and Predicting HIV Risk Behavior. *Journal of Personality Assessment*, *65*(3), 586–601. https://doi.org/10.1207/s15327752jpa6503_16

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

Koukounas E., Over R. (1993). Habituation and dishabituation of male sexual arousal. *Behavioral Research and Therapy*, 31, 575-585. https://doi.org/10.1016/0005-7967(93)90109-8

Krone, T., Spiranovic, C., Prichard, J., Watters, P., Wortley, R., Gelb, K., & Hunn, C. (2020). Child sexual abuse material in child-centred institutions: situational crime prevention approaches. *Journal of Sexual Aggression*, *26*(1), 91–110. https://doi.org/10.1080/13552600.2019.1705925

Laier, C., & Brand, M. (2014). Empirical evidence and theoretical considerations on factors contributing to cybersex addiction from a cognitive-behavioral view. *Sexual Addiction & Compulsivity, 21*(4), 305–321. https://doi.org/10.1080/10720162.2014.970722

Mullers, E., & Dowling, M. (2008). Mental health consequences of child sexual abuse. *British Journal of Nursing*, *17*(22), 1428–1433. https://doi.org/10.12968/bjon.2008.17.22.31871

Okabe, Y., & Ito, D. (2022). Exploring the gender differences on the problematic pornography use related to the Pornographic Media and Self-Control and Behavioral Activation System in Japan. *Sexual Health & Compulsivity*, *29*(3–4), 149–170. https://doi.org/10.1080/26929953.2022.2113192

Paquette S, Fortin F, Perkins D. Online sexual offenders: typologies, assessment, treatment, and prevention. The Wiley handbook of what works with sexual offenders: contemporary perspectives in theory, assessment, treatment, and prevention. 2020;22:311–326. doi: 10.1002/9781119439325.ch18.

Pfefferbaum, B., & Wood, P. H. (1994). Self-report study of impulsive and delinquent behavior in college students. *Journal of Adolescent Health*, *15*(4), 295–302. https://doi.org/10.1016/1054-139x(94)90602-5

Piquero, A. R., MacDonald, J. M., Dobrin, A., Daigle, L. E., & Cullen, F. T. (2005b). Self-Control, Violent Offending, and Homicide Victimization: Assessing the General Theory of Crime. *Journal of Quantitative Criminology*, *21*(1), 55–71. https://doi.org/10.1007/s10940-004-1787-2

Quayle, E., & Taylor, M. (2004). Model of problematic internet use in people with a sexual interest in children. CyberPsychology & Behavior, 6 (1). https://doi.org/10.1089/109493103321168009

Ray, J. V., Kimonis, E. R., & Seto, M. C. (2014). Correlates and moderators of child pornography consumption in a community sample. *Sexual Abuse : A Journal of Research and Treatment*, *26*(6), 523. https://doi.org/10.1177/1079063213502678

Sapp, M. V., & Vandeven, A. M. (2005). Update on childhood sexual abuse. *Postgraduate Obstetrics & Gynecology*, *25*(22), 1–7. https://doi.org/10.1097/00256406-200511150-00001

Seigfried-Spellar, K. C., & Rogers, M. K. (2013). Does deviant pornography use follow a Guttman-like progression? *Computers in Human Behavior*, *29*(5). . https://doi.org/10.1016/j.chb.2013.04.018

Seto, M. C., Hermann, C. A., Kjellgren, C., Priebe, G., Svedin, C. G., & Långström, N. (2014). Viewing Child Pornography: Prevalence and correlates in a representative community sample of young Swedish men. *Archives of Sexual Behavior*, *44*(1), 67–79. https://doi.org/10.1007/s10508-013-0244-4

Steinberg, L. (2010). A dual systems model of adolescent risk-taking. *Developmental Psychobiology, 52*(3), 216–224.

Steine, I. M., Winje, D., Skogen, J. C., Krystal, J. H., Milde, A. M., Bjorvatn, B., Nordhus, I. H., Grønli, J., & Pallesen, S. (2017). Posttraumatic symptom profiles among adult survivors of childhood sexual abuse: A longitudinal study. *Child Abuse & Neglect*, *67*, 280–293. https://doi.org/10.1016/j.chiabu.2017.03.002

Suler, J. (2004). The online disinhibition effect. *CyberPsychology & Behavior*, 7(3), 321–326. https://doi.org/10.1089/1094931041291295

Tangney, J. P., Baumeister, R. F., & Boone, A. L. (2004). High Self-Control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality*, *72*(2), 271–324. https://doi.org/10.1111/j.0022-3506.2004.00263.x

Testa, G., Villena-Moya, A. & Chiclana-Actis, C. Emotional Dysregulation and Coping Strategies in the Context of Problematic Pornography Use: A Narrative Review. *Curr Addict Rep* **11**, 229–241 (2024). https://doi.org/10.1007/s40429-024-00548-0

Tonmyr, L., & Shields, M. (2016). Childhood sexual abuse and substance abuse: A gender paradox? *Child Abuse & Neglect*, *63*, 284–294. https://doi.org/10.1016/j.chiabu.2016.11.004

Wortley, R., Findlater, D., Bailey, A., & Zuhair, D. (2024). Accessing child sexual abuse material: Pathways to offending and online behaviour. *Child Abuse & Neglect*, *154*, 106936. https://doi.org/10.1016/j.chiabu.2024.106936

Wright, P. J. (2013). U.S. males and pornography, 1973–2010: Consumption trends and individual differences. *Journal of Sex Research, 50*(1), 60–71. https://doi.org/10.1080/00224499.2011.628132

Zuckerman, M. (2007). Sensation seeking and risky behavior. *Choice Reviews Online*, *45*(04), 45–2321. https://doi.org/10.5860/choice.45-2321