

**Violent Pornography Consumption and Sexual Perpetration: the Role of Hostile
Masculinity, Sexual Arousal, and Masturbation**

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Abstract

Increased availability of pornography has raised questions about whether it influences sexual perpetration. Research up to date has demonstrated that violent pornography is associated with sexual perpetration, while indicating that this relationship is stronger among men at high risk for sexual perpetration. Other potential explanations for this relationship have been theorized, such as sexual arousal and masturbation, but have rarely been tested. This study seeks to contribute to testing these theories with the following hypotheses: (1) sexual arousal will mediate the effect of violent pornography consumption on sexual perpetration, and this indirect effect (violent pornography on arousal) will be stronger for men high in hostile masculinity, and (2) masturbation will moderate the relationship between violent pornography consumption and sexual perpetration. A sample of heterosexual men (N=102) completed a self-report questionnaire assessing these relationships through a non-probability self-selection and convenience sampling. Results indicated that the indirect effect of violent pornography consumption on sexual perpetration through sexual arousal did not vary across different levels of hostile masculinity. The results also indicated no moderating effect of masturbation on the relationship between violent pornography consumption and sexual perpetration. These findings indicate that the theoretical background underlying the pathways tested in this thesis may be incomplete and highlight the need for future research to investigate additional factors that may affect these relationships.

Keywords: violent pornography, sexual perpetration, sexual arousal, hostile masculinity, masturbation, moderated mediation

Globally, one in three women experiences sexual violence (World Health Organization, 2021). The increased availability of pornography (Binnie & Reavey, 2019) has raised concerns about its effects on consumers and whether it contributes to sexual violence, especially because (violent) pornography often depicts violence against women (Shor & Seida, 2018). Further, pornography has been criticized for acting as a source of sexual knowledge, especially for adolescents and young adults (Sun et al., 2014). As such, it can give consumers inaccurate and unrealistic expectations regarding sex and falls short in portraying the consequences of risky sexual behaviors (Sun et al., 2014). Through repeated consumption, pornography can become part of an individual's sexual scripts, which are cognitive frameworks guiding real-world sexual activities and are activated as a force of habit (Wright, 2011). Obtained sexual scripts can further support misogynistic views and sexually violent behavior (Bridges et al., 2016; Marshall et al., 2020; Tomaszewska & Krahe, 2016; Wright, 2011). Pornography is consumed daily by different demographic groups; however, most studies show men as primary consumers (Carroll et al., 2008; Hald, 2006), and they are also more likely to consume violent pornography (Romito & Beltramini, 2015; Sabina et al., 2008).

Summary of Research on Pornography and Sexual Violence

The research on a causal link between (violent) pornography consumption and sexual violence has produced mixed findings. For example, Ferguson and Hartley (2020) note that most studies report small but significant effects in samples of adolescents and college students; however, the overall association is weak or insignificant, especially when studying non-violent pornography. Most researchers and meta-analyses agree that violent pornography is a better predictor and a risk factor for sexual violence. While there is no concise operationalization of violent pornography, there are some common acts that most research considers as falling under

this category. These are depictions of violent sex, sadism, non-consensual (rape) and degrading acts, and necrophilia, while some studies also include sex with children in this category (Malamuth, 2018; Oddone-Paolucci et al., 2000; Romito & Beltramini, 2015). At the same time, physical aggression is not limited only to violent pornography; it has been found that most mainstream pornography frequently depicts acts of sexual aggression - such as choking, gagging, or slapping - and it is directed almost exclusively towards women (Shor & Seida, 2018). Moreover, women in pornography clips “respond to aggression appetitively or by displaying no reaction at all” (Fritz et al., 2020, p. 3050). However, mainstream pornography portrays subtle sexual violence, while violent pornography centralizes sexually violent acts at its core.

To better understand the findings in this field, several meta-analyses were conducted. Recent studies revealed that the overall effect of pornography on behavior is more pronounced for verbal aggression as opposed to physical aggression and pointed out that this association is stronger in violent pornography (Wright et al., 2016). Moreover, exposure to violent pornography was found to predict all types of sexual violence and has a stronger predictive value in correlation studies (Ferguson & Hartley, 2020; Ybarra & Thompson, 2017). Furthermore, this link appears to be stronger among male consumers; college students with higher violent pornography consumption self-report a greater likelihood of committing rape (Rodenhizer & Edwards, 2019). However, there are also several studies that suggest that depictions of violent sex will only impact those who are already at risk of committing sexual offenses (Malamuth et al., 2011).

Studies have also investigated the effects of pornography on a broader spectrum of psychological and behavioral impacts (e.g., attitudes supporting sexual aggression). These effects are again more pronounced for men with high levels of violent sexual media consumption

(Foubert et al., 2011; Foubert & Bridges, 2016; Malamuth, 2018), and pre-existing risk factors for sexual perpetration (Hald et al., 2010; Malamuth et al., 2011). This shows how violent pornography consumption is not an isolated risk factor, but interacts with other risk factors. Furthermore, victim statements have also confirmed that pornography consumed by their male partners influenced their behavior during assault, such as re-enacting acts they saw (DeKeseredy & Corsianos, 2015; Tarzia & Tyler, 2021). These studies indicate that pornography, especially violent pornography, is associated with shaping attitudes and cognitive frameworks.

In summary, violent pornography seems to better explain the association between pornography and sexual violence. Moreover, these studies both highlight the need for and call on future researchers to study mediators and moderators and focus on men who already hold attitudes that put them at risk for sexual perpetration.

The Role of Hostile Masculinity

Research thus far indicates that personality traits may be crucial when studying the relationship between pornography consumption and sexual violence. The Confluence Model states that there are two main paths that can lead to sexual offending: the first characterized by hostile masculinity and the second by impersonal sexuality (Malamuth, 2018). Hostile masculinity entails a distrustful attitude towards women, alongside narcissistic, defensive, and insecure attitudes and sexual satisfaction coming from controlling and dominating women (Malamuth et al., 2017; Vega & Malamuth, 2006). Moreover, research on hostile masculinity also includes acceptance of rape myths and interpersonal violence (as a way for men to achieve sexual relationships) as characteristics of hostile masculinity (Ray et al., 2023). Meanwhile, impersonal sexuality is characterized by a manipulative and non-committal orientation towards sexual relationships (Wheeler et al., 2002).

Empirical research supports this model, indicating that men high in hostile masculinity and impersonal sexuality are more likely to use coercive tactics in relationships, engage in verbal and emotional abuse, and self-report a history of sexual perpetration (Malamuth et al., 1995; Wheler et al., 2002). Moreover, hostile masculinity was a significant predictor of sexual aggression by itself in several studies (Kohut et al., 2020; Ray & Parkhill, 2023; Saqib & Davidson, 2023; Thompson & Morrison, 2013). Within the Confluence Model, pornography is hypothesized to be a secondary risk factor for those already at risk of sexual offending, and it increases the risk of priming and further reinforcing sexually aggressive attitudes, thoughts, and emotions (Hald & Malamuth, 2014; Malamuth, 2018). Some studies showed that pornography consumption, when added to the Confluence Model, is a significant predictor of sexual violence (Vega & Malamuth, 2006; Saqib & Davidson, 2023), and men high in hostile masculinity and interpersonal sexuality consume more violent sexual media (Baer et al., 2015). Other studies found that pornography consumption did not add anything to the Confluence Model (e.g., Kohut et al., 2020).

Sexual Arousal as a Mediator of the Pornography and Sexual Perpetration Relationship

Sexual arousal is another variable proposed to link pornography and sexual violence. The Confluence Model can be further utilized for this explanation (Hald & Malamuth, 2014). Pornography is designed to elicit a sexual arousal response, creating positive and pleasurable associations with its consumption (Hald & Malamuth, 2014). Sexual arousal induced by pornography is hypothesized to be an additional priming and activating force of sexually aggressive scripts for individuals at risk for sexual perpetration (Hald & Malamuth, 2014; Hald et al., 2014; Peter & Valkenburg, 2008). Moreover, it has been theorized that high-risk individuals, who hold attitudes supporting sexual violence or have a history of sexual

perpetration, are more likely to consume sexually violent media and experience heightened sexual arousal (Rodenhizer & Edwards, 2019). Due to the mediating effect of sexual arousal, pornography can become more than a fantasy for these individuals and increase the risk of sexual perpetration.

Research shows that men – regardless of whether they have a history of sexual coercion - who experience higher levels of sexual arousal to pornographic material are more likely to imagine using sexually coercive tactics in a date-rape scenario and more likely to use verbal coercion to obtain sex (Craig et al., 2020; Loewenstein et al., 1977). Similarly, sexual arousal to violent pornography predicted men’s self-reported likelihood of sexual aggression (Davis et al., 2006), and convicted rapists have been found to show more sexual arousal to coercive sexual acts (Lalumière et al., 2003). When considering personality traits, research has found further results. For men low in agreeableness, sexual arousal to pornography mediated the relationship and increased hostile masculinity levels and attitudes supporting violence (Hald et al., 2013; Hald & Malamuth, 2014). Furthermore, even though Marshall et al. (2020) found that sexual arousal to pornography only mediated sexual aggression in a women’s sample, among men with high levels of rape myths and high sexual arousal, a higher likelihood of sexual coercive tactics was reported. These studies show that sexual arousal may play an important role in the relationship between pornography and problematic attitudes and behavior, with the effect being more pronounced in men already at risk of sexual perpetration.

Masturbation as a Moderator of the Pornography and Sexual Violence Relationship

While sexual arousal may mediate the relationship between violent pornography and sexual perpetration, masturbation could position itself as an additional reinforcer of this relationship. So far, not much research has investigated masturbation as a moderator between

pornography consumption and sexual violence. This is surprising given that masturbation more often than not accompanies viewing of pornography (Prause, 2019; Bridges et al., 2016). Prause (2019) even stated that pornography research that does not include masturbation cannot be understood as a “study of pornography effects” (Prause, 2019, p. 2019).

Firstly, we need to consider a media-heuristic model, which posits that media creates easily accessible memory paths that are activated by real-world scenarios, ultimately affecting decision-making (Sun et al., 2014). Applying this to the context of pornography means that pornography causes the development of heuristic sexual scripts (Gagnon & Simon, 2017; Gecas & Libby, 1976), which are later used to navigate real-world sexual activities (Sun et al., 2014). Furthermore, we can use conditioning theory, which suggests that masturbating to pornography can reinforce an individual’s sexual response to the context seen (Seto et al., 2001). Wright’s (2011) 3 AM model (Acquisition, Activation, Application) further elaborates on this. According to this model, pornography can give consumers scripts that they are not even aware of (acquisition), these scripts are primed (activation), and are used in real-world sexual acts (application) (Todesco & Camoletto, 2021). Activation is theorized to happen through masturbation, which is treated as a self-stimulation that further increases the likelihood of being affected by pornography scripts (Wright, 2011). The 3 AM model states that rewarding behaviour to pornography, such as masturbation, will serve as inactive rehearsal that increases the likelihood of sexual scripts being used in the real world (Todesco & Camoletto, 2021). Similarly, Leonhardt et al. (2019) theorized that if masturbation accompanies pornography viewing, this will likely further strengthen the sexual scripts portrayed.

So far, only one study assessed the moderating effect of masturbation. Todesco and Camoletto (2021) assessed this in a women’s sample and found that those who watched

pornography in adolescence and masturbated to it were more likely to engage in a wider variety of sexual acts, had more partners, and held a higher agreement regarding recreational sexual attitudes later in adulthood.

Despite limited research testing this model, the proposed theoretical background still shows that masturbation should not be overlooked when evaluating the relationship between pornography and sexual perpetration. Masturbation might play a crucial role in transforming pornography induced fantasies into enacted behaviour.

The Present Study

The present study will examine the roles of hostile masculinity, sexual arousal, and masturbation in the relationship between violent pornography consumption and sexual perpetration. Since most sexual perpetration against women is enacted by men (World Health Organization, 2021), this study will only look at heterosexual men. This study will specifically look at the consumption of violent pornography, since it has produced more consistent results.

Sexual arousal is conceptualized as a mediator in the relationship between violent pornography consumption and sexual perpetration because pornography is designed to elicit sexual arousal in consumers (Hald & Malamuth, 2014), which may serve as a reinforcing and activating force of sexually aggressive scripts for at-risk individuals (Hald et al., 2014; Hald & Malamuth, 2014; Peter & Valkenburg, 2008). Studies show that men who have perpetrated report a higher level of sexual arousal to violent pornography (Lalumière et al., 2003), suggesting that violent pornography might be differently arousing for individuals already at risk of sexual perpetration (Rodenhizer & Edwards, 2019). Moreover, research found that heightened sexual arousal to violent pornography was associated with self-reported likelihood of using coercive

sexual acts (such as rape) in imagined scenarios (Craig et al., 2020; Davis et al., 2006; Loewenstein et al., 1977).

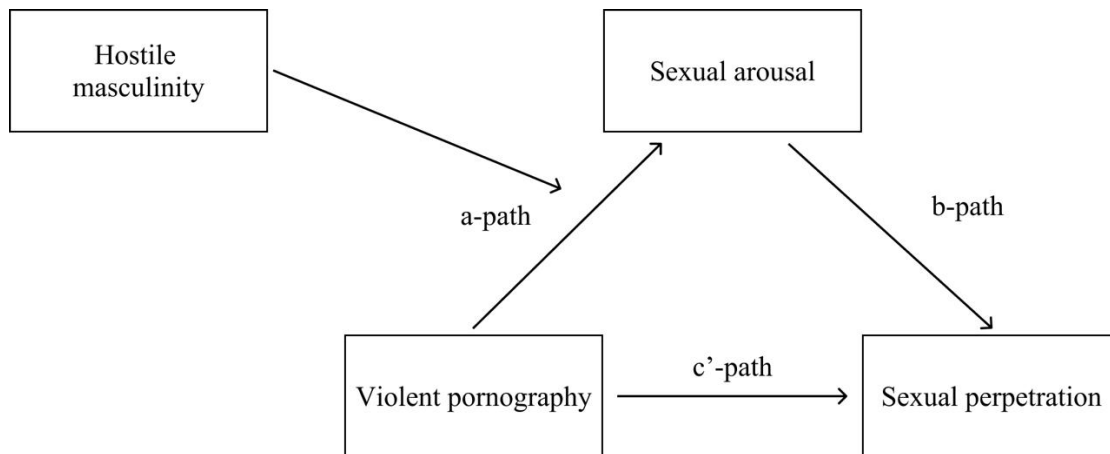
Hostile masculinity was positioned as a moderator of the path between violent pornography and sexual arousal. Firstly, hostile masculinity is characterized by sexual satisfaction from controlling and dominating women, rape-myth endorsement, and accepting sexual violence to achieve sexual relations (Malamuth et al., 2017; Ray et al., 2023; Vega & Malamuth, 2006). Secondly, the Confluence Model positions hostile masculinity as one of the main paths that lead to sexual perpetration. Therefore, for men high in hostile masculinity, violent pornography might be more arousing since it presents them with scripts already in line with their attitudes and further amplifies the risk for sexual perpetration via sexual arousal.

Building on the 3 AM model (Wright, 2011), this study will investigate whether masturbation is a moderator of the relationship between violent pornography and sexual perpetration. Since masturbation is theorized to be a mechanism through which sexual scripts portrayed in pornography are reinforced and later used in real life (Gagnon & Simon, 1973; Gecas & Libby, 1976; Sun et al, 2014), higher frequencies of masturbation could further increase the possibility of sexual perpetration after masturbating to violent pornography. The moderating effect of masturbation in the context of the 3 AM model has not yet been tested in heterosexual men, nor in the relationship between violent pornography consumption and sexual perpetration.

This study will test the following hypotheses: (H1) Sexual arousal will mediate the effect of violent pornography consumption on sexual perpetration, and this indirect effect (violent pornography on sexual arousal) will be stronger for men high in hostile masculinity, and (H2) Masturbation will moderate the relationship between violent pornography consumption and sexual perpetration.

Figure 1

The Conceptual Model of the First Hypothesis



Methods

Participants

G*Power calculations to determine the required sample size were performed three times. Power calculation for moderated mediation was conducted based on the recommendation by Arndt Regorz (*Power Moderated Mediation*, n.d.). For both the a-path and b-path (see Figure 1), a small to medium effect size was chosen based on previous research in this field. For the first hypothesis (moderated mediation) required sample size was 124 for a power of .80, assuming a small to medium effect ($f^2 = .085$) and $\alpha = .05$. For moderation (hypothesis 2) required sample size was 95 participants for power of .80 assuming small to medium effect ($f^2 = .085$) and $\alpha = .05$. Post hoc-analysis for moderated mediation, using the sample size of 102, an effect size of $f^2 = .085$ and $\alpha = .05$, indicated that both a and b-path had power of .83. Using the product of the calculated power (of both paths) yields an overall power of .69 ($.83 \times .83 = .69$).

Participants were recruited online, through student networks, social media, and a university student participation platform. Additionally, they were recruited through sexual

education media platforms (*e.g.*, Let's Talk about Sex) and Reddit. To encourage participation, respondents could enter a random draw for one 100 € or two 50 € Amazon vouchers by voluntarily providing their email address at the end of the survey. Participants were eligible to continue the survey if they were men between 18 and 35 years old.

The sample consisted of 102 male participants, with most participants being between 19 and 23 years old ($M=22.90$). Most of the participants identified themselves as belonging to a white ethnic group (71.6%). Most of the sample consisted of students (59.4%) and part-time employees (22.8%). Regarding educational background, 37.3% had obtained a high-school diploma or equivalent, 28.4% partially completed a college or university education (no degree), and 21.6% had obtained a bachelor's degree.

Materials

For the exploration of hypotheses, the following materials were used from the survey: Hostility Towards Women Scale (Check, 1985), Sexual Experiences Short-Form-Perpetration (Koss et al., 2007), and Pornography Consumption Questionnaire (Hald, 2006).

Hostility Toward Women Scale

The Hostility Toward Women Scale (HTWS) was developed by Check (1985). The scale measures participants' attitudes toward women as defined by Check (1988). The original scale is a 30-item measured by marking statements as true or false, however, in this study, a modified scale by Lonsway and Fitzgerald (1995) was adopted consisting of 10 items (*e.g.*, I feel that many times women flirt with men just to tease them or hurt them), where participants rated items on a Likert-type scale of 1 (strongly disagree) to 5 (strongly agree). Lonsway and Fitzgerald (1995) reported the scale's internal consistency, Cronbach's alpha .83 (for 10 items). In this sample, internal consistency was similar with Cronbach's alpha being .81.

For the purposes of analysis, all items will be averaged to produce a continuous score for each participant, with higher scores indicating greater levels of hostile masculinity.

Sexual Experiences Survey-Short Form Perpetration

Sexual Experiences Survey-Short Form Perpetration (SES-SFP) was formed by Koss et al. (2007) and has been widely used as a measure of a spectrum of sexual perpetration acts (from unwanted sexual contact to rape and attempted sexual perpetration). The biggest advantage of SES is not using terms such as rape but instead describing acts and tactics that perpetrators have committed or used (Koss et al., 2007). Since SES-SFP is conceptualized as a formative measure, Cronbach's alpha in this case is not a useful measure (Anderson et al., 2017; Koss et al., 2007). A study by Anderson et al. (2017) assessed the internal consistency of SES-SFP and reported good evidence for internal consistency (measured by Spearman's rho).

Participants were informed that their data is anonymous and were instructed to answer as honestly as they felt comfortable. This scale consisted of 21 items. The first 10 items ask participants how many times they committed a non-consenting act toward someone (e.g., I masturbated in front of someone without their consent). Participants then read descriptions of sexual perpetration acts (e.g., Since the age of 14, I fondled, kissed, or rubbed up against the private areas of someone's body, lips, breast/chest, crotch, or butt) with this part consisting of seven items. Under each description, four techniques or behaviours that are used to sexually perpetrate or attempt sexual perpetration were described: "(a) verbal pressure, (b) verbal criticism, (c) incapacitation, (d) physical threats, and (e) physical force" (Anderson et al., 2017, p. 632). Participants then indicated how many times they have engaged in the described techniques or behaviours, using a Likert scale ranging from 0 (never), 1 (once), 2 (twice), or 3+ (three or more times). This is followed by a question asking whether they had committed sexual

perpetration more than once (1 item). If they had perpetrated more than once, they were asked the gender of the person they had perpetrated against (1 item), whether they think they had raped someone (1 item), and whether they had been a victim themselves (1 item).

To obtain a continuous score of sexual perpetration, the first 17 items were used (see Appendix B), and the mean was calculated across all the items, with higher scores indicating higher levels of sexual perpetration committed. Additionally, to analyse the most severe perpetration acts committed, the ordinal scoring by Koss et al. (2007) (see Appendix C) was adapted by analysing response patterns of participants, which puts each participant in one of five groups (nonvictim, sexual contact, sexual coercion, attempted rape, and rape) based on the most severe perpetration act they had committed.

Pornography Consumption Questionnaire

The Pornography Consumption Questionnaire was based on Hald's (2006) questionnaire. Participants are first instructed to read about pornographic material. Pornography was defined as any explicit material creating or enhancing sexual thoughts or feelings in the participant. It was described as including "explicit exposure and descriptions of the genitals, and clear and explicit sexual acts, such as vaginal intercourse, anal intercourse, oral sex, masturbation, bondage, sadomasochism, rape, urine sex, animal sex, etc" (Hald 2006, p.579). The materials used in magazines such as Playboy were deemed not explicit enough and were not included as pornography in this study. Participants were asked to answer each item honestly.

The questionnaire had 50 items in total. To test the hypotheses the following items were used: frequency of masturbation (1 item), how often they watch specific themes of pornography (e.g., Please indicate how frequently you engage with pornography depicting the following activities/themes, using the scale provided: vaginal penetration) (21 items) and the level of

sexual arousal experienced by each category of pornography (21 items). Both masturbation and consumption of specific themes of pornography are rated by participants on a Likert scale from 0 (never) to 5 (always). Sexual arousal experienced by a specific theme of pornography is also rated on a Likert scale from 0 (not arousing) to 5 (extremely arousing).

To obtain the variable of violent pornography consumption first 21 items (see appendix B) were averaged together to obtain a continuous variable, and the same was done to create a continuous score of sexual arousal. Higher scores for both variables indicated higher consumption of violent pornography or higher sexual arousal. For the purpose of the hypotheses, only activities/themes that would fall under violent pornography were included in the violent pornography consumption and sexual arousal variable, which were: rape pornography, S&M/bondage, sex with people under the age of eighteen, sex with children, sex with teens, snuff (women being murdered in sexual content), and violent sex. Since one of the main components of violent pornography is a lack of consent, categories of sex with people under 18, child pornography, and sex with teens pornography were counted as violent pornography, even though it has rarely been done in previous research; however similar approach was taken in research by Romito and Beltramini (2015). The variable of masturbation frequency was also treated as continuous in the analysis, but because it was based on a single item, no composite score was created.

Procedure

The Present Study

The present study used a cross-sectional correlation survey design. The survey was programmed in Qualtrics. Participants were recruited through a non-probability self-selection method (individuals who encountered the survey link and chose to participate) and convenience

sampling through Erasmus University Rotterdam student participation platforms. They were informed that this research looks at various aspects of sex and sexual behaviour, including sexual victimization and whether they had victimized someone else. Because of the survey's nature, links to support organizations were provided. Respondents were informed that the data is anonymous and shared only with the research team. Withdrawal was possible at any time. The whole survey took approximately 30 minutes to complete. Ethics approval was obtained from Erasmus University Rotterdam.

Analysis

First, the exclusion criterion of only heterosexual male participants and completion of up to 75% of the survey were applied, reducing the initial sample of 284 to 104 participants. All items were analysed with Missing Value Analysis in SPSS, which revealed that missing values were missing at random. After examining response rates for the hypothesis-relevant scales, the final sample comprised 102 participants, with two excluded due to incomplete pornography consumption questionnaires (i.e., less than 80% of the scale completed).

Before the main analyses, assumptions of ordinary least squares regression were assessed. As bootstrapping was performed in the main analyses, the following assumptions were assessed: independence of observations, linearity, homoscedasticity, multicollinearity, and normality (Clement et al., 2022). Additionally, the sample was screened for outliers during assumption testing. Outlier analysis identified several influential points that were potentially affecting regression coefficients. Inspection of these points revealed that the data are extreme points, yet plausible responses. Since outliers could potentially influence parameter estimates, the primary analysis was carried out excluding outliers to estimate effects within the sample's typical range. To test the robustness of the findings, a sensitivity analysis was carried out,

including outliers. Results showed no major differences after excluding influential points (all paths remained the same regarding their significance). Due to this, only sensitivity analysis (N=102) was reported in the results section for both analyses.

Both hypotheses were analysed with Hayes' PROCESS macro in SPSS, which performs bootstrapping automatically with 5,000 resamples, and a heteroscedasticity-consistent standard error estimator (HC4) was used due to a skewed dependent variable and mild heteroscedasticity. The first hypothesis was assessed with Model 7 (moderated mediation), with violent pornography consumption as predictor (x), sexual arousal as mediator (m), hostile masculinity as moderator (w) of the path between predictor and mediator, and sexual perpetration as outcome (y). The second hypothesis was assessed with Model 1 (moderation), with violent pornography consumption as the predictor (x), masturbation as the moderator (w), and sexual perpetration as the outcome (y).

Results

Most participants (N= 102) had, in the past six months, used pornography weekly, either 1-2 times per week (35.3 %) or 3-5 times per week (25.5 %). Table 1 shows descriptive statistics for pornography categories regarding their consumption and sexual arousal.

Table 1

Descriptive Statistics of Consumption and Sexual Arousal across Violent Pornography

Activities/Themes

Violent Pornography	Consumption			Arousal		
	<i>M</i>	<i>SD</i>	Range	<i>M</i>	<i>SD</i>	Range
Rape	0.1	0.5	3	0.2	0.6	4

Violent Pornography	Consumption			Arousal		
	<i>M</i>	<i>SD</i>	Range	<i>M</i>	<i>SD</i>	Range
S&M/bondage	0.4	0.8	4	0.7	1.0	4
Sex with people under 18	0.2	0.8	4	0.2	0.7	4
Sex with children	0.0	0.0	0	0.0	0.0	0
Snuff	0.0	0.0	0	0.0	0.1	1
Teen	1.0	1.2	4	1.2	1.3	4
Violent sex	0.4	0.7	3	0.4	0.9	4

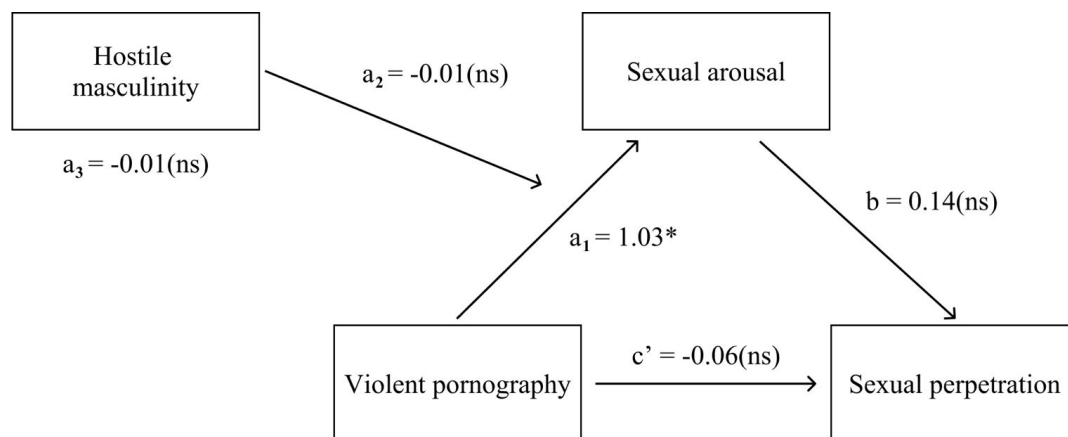
Note. $N=102$. The table displays descriptive statistics of different violent pornography activities/themes regarding their consumption (“Please indicate to what extent you use pornography with the following activities/themes”) and their sexual arousal (“Please indicate how arousing you find pornography with the following activities/themes”) based on a Likert scale (1=never/not at all arousing to 5=always/extremely arousing).

Of the 102 participants, the majority did not commit any perpetration (78.4%), and four participants were excluded from all categories due to missing values. This was followed by the category of sexual contact (7.9%) and rape (4.9%), while the sexual coercion group was small (2%), as was attempted rape (2.9%). Overall, 18.8 % ($N=19$) of the sample had committed the acts described on the SES-SFP scale more than once. Seventeen respondents reported committing sexual perpetration against women, and nine participants in the sample thought that they might have raped someone.

Hypothesis 1 was assessed with Hayes' PROCESS macro (model 7). The interaction effect of violent pornography consumption and hostile masculinity on sexual arousal was negative and non-significant ($b = -0.01$, $t = -0.03$, $p = .976$). The conditional indirect effects of violent pornography consumption on sexual perpetration through sexual arousal were not significant at low, mean, or high levels of hostile masculinity, as all bootstrap confidence intervals included zero (see Table 2A). The index of moderated mediation was negative and not statistically significant ($b = -0.00$; 95% Bca CI $[-0.03, 0.11]$, as the confidence interval included zero. For the full regression results, see Table 2A (Appendix A). The moderated mediation model is presented in Figure 2.

Figure 2

Moderated Mediation Model of Violent Pornography, Sexual Arousal, and Sexual Perpetration as a Function of Hostile Masculinity



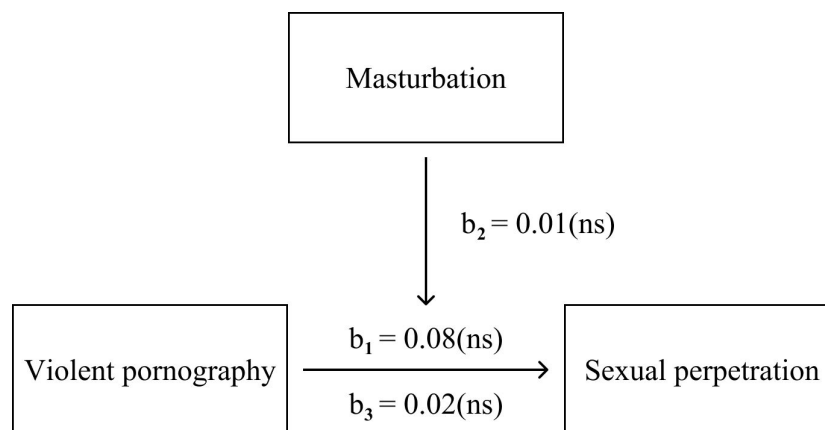
Note. Paths a_1 , a_2 , a_3 , b , and c' are path coefficients representing unstandardized regression weights. The path a_1 (main effect of violent pornography on sexual arousal) was significant ($a = 1.03$, $* p < 0.001$). The path a_2 (main effect of hostile masculinity on sexual arousal) was

insignificant ($a_2 = -0.01, p = .784$), and path a_3 (interaction effect of hostile masculinity and violent pornography on sexual arousal) was insignificant ($a_3 = -0.01, p = .976$). The path b (main effect of sexual arousal to sexual perpetration) was insignificant ($b = 0.14, p = .416$). The path c' (the direct effect of violent pornography on sexual perpetration) was insignificant ($c' = -0.06, p = .652$).

Hypothesis 2 was assessed with Hayes' PROCESS macro (Model 1). The overall model was not significant, $F(3, 98) = 1.06, p = .368$, and accounted for 5% ($R^2 = .05$) of the variance in sexual perpetration. There was a positive and insignificant interaction effect of masturbation and violent pornography on sexual perpetration ($b = 0.02, t = 0.14, p = .889$). The test of highest-order unconditional interactions was not statistically significant $F(1, 98) = 0.02, p = .889$, and explained 0% of the variance ($R^2 = .00$) in sexual perpetration. For the full regression table, see Table 3A (Appendix A). The moderated model is presented in Figure 2.

Figure 3

The Moderating Effect of Masturbation on the Relationship Between Violent Pornography and Sexual Perpetration



Note. Paths b_1 , b_2 , and b_3 are path coefficients representing unstandardized regression weights.

The path b_1 (main effect of violent pornography on sexual perpetration) was insignificant ($b_3 = 0.08, p = .469$). The path b_2 (main effect of masturbation on sexual perpetration) was insignificant ($b_2 = 0.01, p = .834$). The path b_3 (interaction effect of violent pornography and masturbation) was insignificant ($b_3 = 0.02, p = .889$).

DISCUSSION

The goal of this study was to examine whether the relationship between violent pornography consumption and sexual perpetration could be mediated by sexual arousal and moderated by hostile masculinity (moderating the path between violent pornography consumption and sexual arousal). Additionally, this study assessed whether masturbation could act as a moderator of the relationship between violent pornography consumption and sexual perpetration.

No support was found for the first hypothesis, indicating that the indirect effect of violent pornography consumption on sexual perpetration through sexual arousal did not change across levels of hostile masculinity. The theoretical background behind this hypothesis suggests that pornography is designed primarily to elicit sexual arousal in its consumers (Hald & Malamuth, 2014), and sexual arousal may further reinforce and activate sexually aggressive tendencies in high-risk individuals (Hald & Malamuth, 2014; Hald et al., 2014; Peter & Valkenburg, 2008). Violent pornography often shows non-consensual or violent sexual acts (Hald & Malamuth, 2014), which is theorized to induce even stronger sexual arousal responses in individuals holding similar tendencies (Rodenhizer & Edwards, 2019). Therefore, hostile masculinity was hypothesized as a moderator of the relationship between violent pornography consumption and sexual arousal, given that individuals high in hostile masculinity hold attitudes supporting sexual

violence and experience sexual satisfaction from controlling and dominating women (Malamuth et al., 2017; Vega & Malamuth, 2006).

Violent pornography was a significant and positive main effect. This means that higher consumption of violent pornography led to higher experienced sexual arousal. This may reflect familiarity with this type of material, which could result in more experienced sexual arousal over time, a pattern found by previous studies (Wright et al., 2021). Moreover, individuals tend to seek out sexual content that is in line with their sexual script (Paul, 2009) and may experience more sexual arousal if the sexual material seen is in line with their sexual attitudes or personality characteristics (Rodenhizer & Edwards, 2019). However, the interaction effect of violent pornography and hostile masculinity predicting sexual arousal was non-significant, indicating that the effect of violent pornography consumption on sexual arousal did not differ across levels of hostile masculinity. Therefore, hostile masculinity may only be affecting the type of pornography men consume and look for (because it reflects their sexual scripts), while sexual arousal may reflect a purely physiological response to pornography exposure. Moreover, it is also possible that hostile masculinity may affect sexual scripts and/or behavior after exposure to violent pornography instead of sexual arousal itself. Future research should look into the nature of sexual scripts among men high in hostile masculinity and how this relates to pornography selection and sexual arousal.

The hypothesized pathway linking sexual arousal to sexual perpetration was also not supported, with sexual arousal being a non-significant predictor of sexual perpetration. While prior research indicated that sexual arousal to coercive sexual depictions predicts the use of sexually coercive tactics in imagined scenarios (Craig et al., 2020; Loewenstein et al., 1977), the results of this study indicate that this might not translate to real-world sexual perpetration. As

such, sexual arousal might not be a sufficient predictor on its own in a model predicting sexual perpetration from pornography exposure. Other factors should be considered, such as whether situational context or behavioral opportunity could better explain when increased sexual arousal leads to sexual perpetration. A similar proposal was done by other scholars who studied the effect of sexual arousal (e.g., Bouffard & Miller, 2014).

Neither the index of moderated mediation nor the conditional indirect effect was statistically significant, further showing no support for the first hypothesis. While the theoretical background suggests these pathways, the mechanisms' interplay in sexual perpetration may not yet be fully understood, and other factors should be considered.

The second hypothesis was not supported, by finding no evidence for the moderating effect of masturbation on the relationship between violent pornography consumption and sexual perpetration. Masturbation was positioned as a moderator of the relationship between violent pornography consumption and sexual perpetration based on the 3 AM model (Wright, 2011). Masturbation within this model is hypothesized to reinforce sexual scripts seen in pornography, and by extension, influence sexual behaviour (Todesco & Camoletto, 2021), such as sexual perpetration.

The results indicate that there was no support for moderation with the interaction effect of violent pornography consumption and masturbation being non-significant, meaning that the relationship between violent pornography consumption and sexual perpetration did not vary across different levels of masturbation. In the moderation model, neither masturbation nor violent pornography consumption significantly predicted sexual perpetration. A possible explanation for the results may be the theory itself. The 3 AM model may be criticized for failing to account for individual personality traits. As it has been pointed out by previous research,

violent pornography has a bigger impact on those already at risk of perpetrating (Malamuth et al., 2011), suggesting that the 3 AM model might overestimate its generalizability. Considering personality traits that are considered risk factors leading to sexual perpetration might add more predictive value to the 3 AM model and help to establish which individuals will be more affected by masturbation to pornography.

The present study assessed these associations in a general population sample, and the analysis revealed low rates of sexual perpetration; perpetration frequency for the most severe types was similar to that reported in previous studies (e.g., Anderson et al., 2017) when studying non-clinical or non-offender samples. However, the study's non-significant findings should be interpreted cautiously, given the limited variability in sexual perpetration.

One of the strengths of this study was its novel approach to violent pornography categories/themes, combining two methods. First, it included categories/themes most often identified as violent pornography based on prior research. Second, it expanded on this by including pornography categories/themes portraying minors, such as child or teen pornography, which has so far rarely been done in previous research. By doing so, this study sought to capture the full nuance of the violent pornography definition by specifically expanding on the non-consensual, coercive themes. Furthermore, Malamuth (2018) highlighted that both child pornography and violent pornography share the absence of consent (children being seen as powerless agents). Although future studies should continue researching the operationalization of violent pornography, it is also important to recognize that pornography is drastically changing. Mainstream pornography has been found to portray acts of sexual aggression as well (Shor & Seida, 2018), making the distinction between violent and non-violent pornography increasingly difficult to define. Rather than continuing to separate research between the two types of

pornography, future research might benefit from investigating which types of sexual aggression are present in mainstream pornography, as well as how consumers perceive and interpret such acts. Researching whether consumers recognize these subtle acts as sexual aggression could provide a more nuanced understanding of pornography's effects.

Limitations

The most significant limitations of this study was insufficient power, especially in assessing the first hypothesis. Firstly, based on the sample size and small to medium effect size for the first hypothesis, the aim of achieving a power of 0.80 was not reached, increasing the probability of not finding genuine effects (type II error). Moreover, moderated mediation is a complex model, and an underpowered study may fail to detect interaction effects and conditional indirect effects. Non-significant findings of the first hypothesis should be interpreted cautiously, since they could be reflecting an insufficient power instead of the absence of a true effect.

Another important limitation of this study was measuring the overall masturbation frequency to pornography instead of measuring masturbation frequency to each violent pornography theme. While using single-item measures for unambiguous constructs has been an established approach (Allen et al., 2022; Wanous et al., 1997), it has limitations, including lower reliability and limited capacity to capture behavioral patterns (Allen et al., 2022). Looking at masturbation frequency for each violent pornography theme could have provided a bigger insight into the moderating effect of masturbation in the relationship between violent pornography consumption and sexual perpetration.

Additionally, when interpreting the results of this study, it is important to consider the social desirability factor, which may have influenced self-reported pornography consumption and arousal. We specifically need to consider socially desirable responding, defined as “the need

of (individuals) to obtain approval by responding in a culturally appropriate manner” (Crowne & Marlowe, 1960, p. 353). Socially desirable responding has been a well-established effect in research on sexual behaviour (King, 2022) and in self-reported exposure to pornography (Rasmussen et al., 2018). This may have led to underreporting of consumption of violent pornography themes and sexual arousal experienced from these themes in our sample.

Conclusion

In summary, the present study tested the moderated mediation model predicting sexual perpetration based on the theories and studies of sexual arousal, hostile masculinity, and violent pornography. The present study also tested the moderating effect of masturbation based on the 3 AM model. Although neither model was statistically significant, the present study contributes to the growing body of research in this field. First, this study tested a moderated mediation model based on the theory; although the individual pathways had been tested previously, they had not been combined into a model in prior research. Second, the 3 AM model has not been tested in a sample of heterosexual men, nor in the relationship between violent pornography and sexual perpetration; therefore, this study contributes to the testing of the proposed 3 AM model (Wright, 2011). Thirdly, this study adapted a novel approach to the operationalization of violent pornography based on its definition to try to capture the full nuance. This study acknowledges that the theories underlying these two models may fail to account for the complex interplay of mechanisms that could affect the relationships examined. Continued research of these pathways could add to developing models that can better assess which factors lead to sexual perpetration.

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Appendix A

Hayes' PROCESS macro-Output Summary for Analysis

Table A2

Summary of Hayes' PROCESS macro-Output for Hypothesis 1

		<i>B</i>	<i>SE (HC4)</i>	<i>t</i>	<i>p</i>	95% CI	
Model						<i>LL</i>	<i>UL</i>
a-path	(constant)	0.39	0.02	15.49	<.001	0.34	0.43
	Violent Pornography	1.03	0.12	8.55	<.001	0.79	1.27
	Hostile Masculinity	-0.01	0.05	-0.28	.784	-0.11	0.08
	Interaction_1	-0.01	0.29	-0.03	.976	-0.58	0.57
b/c'-path	(Constant)	-0.01	0.05	-0.21	.831	-0.12	0.10
	Violent Pornography	-0.06	0.13	-0.45	.652	-0.32	0.20
	Sexual Arousal	0.14	0.18	0.82	.416	-0.21	0.50
Conditional Indirect Effects via Sexual Arousal							
Hostile Masculinity		Indirect Effect		BootSE		Boot 95% CI	
-0.574		0.15		0.16		[-0.06, 0.51]	
0.000		0.15		0.16		[-0.05, 0.56]	
0.574		0.15		0.18		[-0.05, 0.62]	

Note. $N = 102$. $SE(HC4)$ = heteroscedasticity consistent standard error, CI = confidence interval, LL = lower limit, UL = upper limit, Interaction_1 = violent pornography x hostile masculinity, Model for the a-path $R^2 = .78$, $F(3, 98) = 127.37$, $p < .001$. Model for the b/c'-path $R^2 = .09$, $F(2, 99) = 1.05$, $p = .352$. The conditional indirect effect shows the estimated effect of violent pornography on sexual perpetration through sexual arousal, at low (-1SD), mean, and high

(+1SD) levels of hostile masculinity. Regression coefficients were reported using the HC4-robust standard error, and conditional indirect effects were based on 5,000 bootstrapped samples, with 95% bias-corrected confidence intervals.

Table A3

Summary of Hayes' PROCESS macro-Output for Hypothesis 2

Model	<i>B</i>	<i>SE (HC4)</i>	<i>t</i>	<i>p</i>	95% CI	
					<i>LL</i>	<i>UL</i>
(constant)	0.04	0.03	1.66	.101	-0.01	0.09
Violent Pornography	0.08	0.12	0.73	.469	-0.14	0.29
Masturbation	0.01	0.05	0.21	.834	-0.09	0.11
Interaction_1	0.02	0.18	0.14	.889	-0.33	0.38

Note. *SE(HC4)* = heteroscedasticity consistent standard error, CI=confidence intervals, *LL* = lower limit, *UL* = upper limit, Interaction_1 = violent pornography x masturbation. Regression coefficients were reported with HC4-robust standard errors.

Appendix B

Survey Measures

Hostile Masculinity Scale (Check, 1985)

Instructions:

Please indicate the extent you agree with the following statements

1. I feel that many times women flirt with men just to tease them or hurt them.
2. I believe that most women tell the truth.
3. I usually find myself agreeing with women.
4. I think that most women would lie just to get ahead.
5. Generally, it is safer not to trust women.
6. When it really comes down to it, a lot of women are deceitful.
7. I am easily angered by women.
8. I am sure I get a raw deal from the women in my life.
9. Sometimes women bother me by just being around.
10. Women are responsible for most of my troubles.

Response Options:

- 1= strongly disagree
- 2= somewhat disagree
- 3=neither agree nor disagree
- 4=somewhat agree
- 5=strongly agree

Sexual Experiences Survey-Short Form Perpetration (Modified from Koss et al., 2007)

Instructions:

The following questions concern sexual experiences. We know these are personal questions, so we do not ask your name or other identifying information. Your information is completely confidential. We hope this helps you to feel comfortable answering each question honestly.

How many times since age 14 did you engage in the following behaviours?

1. I stared at someone in a sexual way or looked at the sexual parts of their body after they had asked me to stop.
2. I made teasing comments of a sexual nature about someone's body or appearance after they had asked me to stop.
3. I sent someone sexual or obscene materials such as pictures, jokes, or stories in the mail or over the Internet, after they had asked me to stop.
4. I showed someone pornographic pictures when they had not agreed to look at them.
5. I made sexual or obscene phone calls to someone when they had not agreed to talk with me.
6. I watched someone while they were undressing, were nude, or were having sex, without their consent.
7. I took photos or videotapes of someone while they were undressing, were nude, or were having sex, without their consent.
8. I showed someone the private areas of my body (ex. butt, penis, or breasts) without their consent.
9. I made sexual motions to someone, such as grabbing my crotch, pretending to masturbate, or imitating oral sex without their consent.
10. I masturbated in front of someone without their consent.

Response Options:

0, 1, 2, 3+

For the following questions, check the box showing the number of times each experience has happened since you were 14 years old. If several experiences occurred on the same occasion- for example, if one night you told some lies and had sex with someone who was drunk, you would check both boxes a and c. The questions are about the time while you were a student.

11. I fondled, kissed, or rubbed up against the private areas of someone's body (lips, breastchest, crotch or butt) or removed some of their clothes without their consent (but did not attempt sexual penetration) by:
12. I had oral sex with someone or had someone perform oral sex on me without their consent by:
13. I put my penis (men only) or I put my fingers or objects (all respondents) into a woman's vagina without her consent by:
14. I put in my penis (men only) or I put my fingers or objects (all respondents) into someone's butt without their consent by:
15. Even though it did not happen, I TRIED to have oral sex with someone or make them have oral sex with me without their consent by:
16. I put in my penis (men only) or I put my fingers or objects (all respondents) into someone's butt without their consent by:
17. Even though it did not happen, I TRIED to have oral sex with someone or make them have oral sex with me without their consent by:

Response Options:

- a. Telling lies, threatening to end the relationship, threatening to spread rumors about them, making promises about the future I knew were untrue, or continually verbally pressuring them after they said they didn't want to.
- b. Showing displeasure, criticizing their sexuality or attractiveness, getting angry but not using physical force after they said they didn't want to.
- c. Taking advantage when they were too drunk or out of it to stop what was happening.
- d. Threatening to physically harm them or someone close to them.
- e. Using force, for example holding them down with my body weight, pinning their arms, or having a weapon.

18. Did you do any of the acts described in this survey 1 or more times?

Response Options:

Yes

No

19. If yes, what was the sex of the person or persons to whom you did them?

Response Options:

Female only

Male only

Both females and males

I reported no experiences

20. Do you think you may have you ever raped someone?

Response Options:

Yes

No

21. Have you been a victim of unwanted sexual contact yourself?

Response Options:

Yes

No

Not sure

Prefer not to say

Pornography Consumption Questionnaire (Modified from Hald et al., 2006)

The following questions are about your use of pornography. For the purpose of these questions, we define pornography as follows: Any kind of material aiming at creating or enhancing sexual feelings or thoughts in the recipient and, at the same time (1) containing explicit exposure and/or descriptions of the genitals and (2) clear and explicit sexual acts such as vaginal intercourse, anal intercourse, oral sex, masturbation, bondage, sadomasochism (SM), rape, urine sex, animal sex etc. Materials containing men and women posing or acting naked, such as seen in Playboy/Playgirl do not contain clear and explicit sexual acts and should not be considered as pornography when completing the questionnaire.

1. How old were you when you first used pornography?

Response Options:

a) 5-8 years old

b) 9-12 years old

c) 13-16 years old

d) Older than 16 years

2. How acceptable do you find using pornography?

Response Options:

- a) Highly acceptable
- b) Acceptable
- c) Unacceptable
- d) Highly unacceptable

3. How realistic do you find pornography?

Response Options:

- a) Very realistic
- b) Somewhat realistic
- c) Neutral
- d) Somewhat unrealistic
- e) Very unrealistic

4. When did you last use pornography?

Response Options:

- a) In the last 24 hours
- b) In the last 48 hours
- c) In the last week
- d) In the last month
- e) In the last six months
- f) In the last year

5. In the past six months, how often did you use pornography?

Response Options:

- a) More than five times per week
- b) 3-5 times per week

- c) 1-2 times per week
- d) 1-2 times per month
- e) Less than once per month
- f) Never in the last six months

6. On average, how many hours a week did you use pornography in the past six months?

Response Options:

- a) Never in the last six months
- b) Less than one hour
- c) 1-3 hours
- d) 4-6 hours
- e) 7-10 hours
- f) More than ten hours

7. When using pornography, how often do you engage in sexual activity alone (i.e. masturbation)?

8. When using pornography, how often do you engage in sexual activity with a partner)?

Response Options:

0=never

1=Rarely

2=Sometimes

3=Often

4=Always

Please indicate to what extent you use pornography with the following activities/themes

9. Vaginal penetration

10. Anal penetration
11. Hentai (animated pornography)
12. Oral sex
13. Rape
14. S&M / bondage
15. Sex with animals
16. Sex with people <18
17. Sex with children
18. Snuff (women being murdered in sexual context)
19. Heterosexual content
20. Lesbian content
21. Gay male content
22. Fetish
23. Teen
24. Group sex
25. Violent sex
26. Bukkake
27. Sex involving urine
28. Sex involving faeces
29. Other, please specify

Response Options:

0=never

1=Rarely

2=Sometimes

3=Often

4=Always

Please indicate how arousing you find pornography with the following activities / themes

30. Vaginal penetration

31. Anal penetration

32. Hentai (animated pornography)

33. Oral sex

34. Rape

35. S&M / bondage

36. Sex with animals

37. Sex with people <18

38. Sex with children

39. Snuff (women being murdered in sexual context)

40. Heterosexual content

41. Lesbian content

42. Gay male content

43. Fetish

44. Teen

45. Group sex

46. Violent sex

47. Bukkake

48. Sex involving urine

49. Sex involving faeces

50. Other, please specify

Response Options:

0=Not at all arousing

1=Somewhat arousing

2=Quite arousing

3=Very arousing

4=Extremely arousing

Appendix C

Scoring System

Ordinal Scoring for The SES-SFV (Koss et al., 2007, p. 370)

Use the following instructions to create non-redundant scores that place each respondent into a mutually exclusive category based on the most severe perpetration.

1. Nonvictim: all 7 items checked 0 times on a, b, c, d, and e
2. Sexual contact: item 1 checked any number of times > 0 on c, d, and e and no other responses > 0 to any other item 2 through 7
3. Sexual coercion: Any item 2 through 7 checked > 0 times to a or b and all options c through e on items 1 through 7 checked 0 times
4. Attempted rape: items 5, 6, or 7 checked any number of times > 0 to c, d, or e AND items 3, 4, and 5 checked 0 times to c, d, and e regardless of responses to any other items
5. Rape: items 3, 4, and 5 checked any number of times > 0 to c, d, or e regardless of responses to any other items

