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Perceived Effects of Sexually Explicit Media among Men who have Sex with Men and Psychometric Properties of the Pornography Consumption Effects Scale (PCES)

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Abstract

Introduction—Researchers have proposed that consumption of Sexually Explicit Media (SEM) may not only adversely influence sexual attitudes and behaviors of Men Who Have Sex with Men (MSM) but (also) play a positive role in the development and sexual education of MSM, be a major source of sexual information for MSM, and provide validation, understanding, and confirmation of MSM's sexual orientation. However, such claims are in urgent need of empirical validation as is the development of psychometrically sound and easily implemented instruments able to reliably assist such validations.

Aim—To investigate how MSM who consume SEM self-perceive the impact of SEM on their STI-related sexual risk behaviors (i.e. anal intercourse), sexual knowledge, enjoyment of sex, interest in sex, attitudes toward sex, and understanding of their sexual orientation. Further, to provide a thorough psychometric validation of a reduced and reworked version of the Pornography Consumption Effect Scale.

Main Outcomes Measures—A revised version of the Pornography Consumption Effect Scale (PCES) by Hald and Malamuth (2008).

Results—This study found that 97% of MSM reported positive effects of SEM consumption on their sexual knowledge, enjoyment of and interest in sex, attitudes toward sex, and understanding of their sexual orientation. Only 3 % reported any negative effects of their SEM consumption. SEM consumption was found to significantly increase consumers' interest in having protected anal intercourse while not significantly influencing their interests in having unprotected anal intercourse. The revised version of the PCES showed excellent psychometric performance.

Conclusion—The study found that MSM generally report positive effects of their consumption of sexually explicit materials in areas related to their sexual knowledge, attitudes, behaviors, and orientation. This finding could have important implications for the sexual health and well-being of

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Ethical Adherence

All research was carried out with the approval of the University of Minnesota Institutional Review Board, study number 0906S68801.

MSM by suggesting that SEM-based education and intervention might hold considerable overall health potential for MSM.

Keywords

pornography; sexually explicit media; sexual knowledge; public health effects; men who have sex with men; homosexuality

INTRODUCTION

Men who have Sex with Men (MSM) are among the population groups at highest risk of sexually transmitted infections (STI's) including HIV(1, 2) and most frequent consumers of pornography.(3, 4) If SEM consumption is associated with adverse effects such as sexual risk behaviors related to HIV/STI's or more generally adverse impacts on sexual attitudes, cognitions, and behaviors, this may have serious implications for the sexual health of MSM. Thus, understanding more about effects of SEM on MSM, if any, may be crucial to both sexual health and STI prevention and management among MSM.(5)

Traditionally, research on effects of SEM has targeted heterosexuals with very few studies including homosexuals. Using a variety of cross cultural samples, methodology, and design, research has generally and with great consistency demonstrated associations between SEM consumption and sexual behaviour in heterosexuals. For example, significant positive relationships have been found between SEM consumption and sexual arousal, frequency of masturbation, varied sexual experiences, pre-coital behaviors, paying for sex or having sex for pay, lower age at first intercourse, number of sexual partners during the past year, number of overall and casual sexual intercourse partners, having multiple lifetime partners, having had extramarital relations, having engaged in oral, anal, or group sex, not to have used contraception during the last intercourse, and to having had an STI.(4, 6–22)

These findings extend to the relatively few studies published on the association between SEM and sexual behaviors or attitudes in MSM. In these studies SEM consumption or specific SEM genres have been found to be positively associated with sexual arousal, anal activities as appealing, interest in third party sex, masturbation, and unprotected anal intercourse.(3, 5, 17,23) Further, use of SEM during partnered sex among MSM has been found to be negatively correlated with condom use during first intercourse with the most recent partner and positively correlated with experience with group sex.(3)

One methodological approach very rarely used in the area of SEM effect research on heterosexuals and never on MSM consists of studying consumers' beliefs about how their own reports with SEM may have affected them. Previous scientific research on self-perceived effects of SEM consumption amongst heterosexuals have found that generally participants report small to moderate positive and no to small negative effects of SEM consumption in areas related to their sexual knowledge, attitudes toward sex, attitudes toward and perception of the opposite gender, sex life, and quality of life in general.(12) For MSM, researchers have proposed that SEM may not (only) adversely impact MSM but (also) play a positive role in young MSM's development and sexual education, be a major source of sexual information, and provide validation, understanding, and confirmation of sexual attraction to men.(5, 24–26)

However, such claims are in urgent need of empirical validation as is the development of psychometrically sound and easily implemented instruments able to reliably assist such validation. Further, quantitative studies investigating how MSM perceive the impact of SEM on their sexual attitudes and behaviors are also urgently needed. Such knowledge may not only contribute to new, innovative, and more efficient STI prevention strategies with

important implications for MSMs' sexual health (27) but also with an understanding of the self-perceived role of SEM in the lives of MSM in important areas related to sexual knowledge, attitudes, behaviors, and orientation.

AIMS

Using two different cohorts of American MSM we aim to investigate how MSM who consume SEM self-perceive the impact of such materials on their STI related sexual risk behaviors (i.e. anal intercourse), sexual knowledge, enjoyment of sex, interest in sex, attitudes toward sex, and understanding of their sexual orientation. In addition, we aim to provide thorough psychometric validation of a reduced and reworked version of the Pornography Consumption Effects Scale (PCES) by Hald and Malamuth (2008). The reduced and reworked version of the PCES was used in the present study and may easily be implemented in both research and applied settings.

METHODS

Participants and Procedure

Samples: The Sexually Explicit Media (SEM) study collected data from two samples. The first sample was a seven-day, test-retest reliability study; the second sample was a larger cross-sectional survey. For both studies, banner advertisements were placed on Gay Ad Network (28) to identify potential participants. Eligibility criteria for both studies included self-identification as male, at least 18 years of age, a report of at least one male sexual partner in the last five years, and a resident of the US or one of its territories. In the main survey (sample two), participants were quota-sampled by race/ethnicity to increase diversity in the main study. The test-retest data collection occurred between January and February 2011, and the main survey data collection occurred between May and August 2011. For the test-retest sample, 933 potential participants began eligibility screening of which 410 were deemed eligible and consented to participate in the study. Of these 410 participants, 326 completed the first survey and were invited to return to complete the retest survey seven days after completing the first survey. Of these 326 men, 241 completed both the test and the retest surveys. For this study, we used data on the relevant scale measure items for the 361 men who provided data on at least one-half of the items specific to the Effects of Pornography measure. In the main survey, a total of 5,201 MSM met the eligibility criteria, of which 1,479 consented to participate in the study and provided information on exposure to pornography. A total of 1,253 participants completed the survey in full. However, for this study, we retained participants who provided data on at least one-half of the items in the measurement of Exposure to Pornography totaling a final study sample of 1,333 participants. Both the test-retest and main surveys were reviewed and approved by the Institutional Review Board at University of Minnesota.

Participant characteristics: Demographic characteristics of the participants in the test-retest and the main survey are detailed in Table 1. Similar to previous work with Internet-based samples, participants in both surveys were younger, predominantly White-identified, well-educated, HIV-negative, and self-identified as gay. The distribution of race/ethnicity differs between the test-retest and main survey samples because of the aforementioned quota sampling.

Measures

Main Outcome Measure

Effects of pornography: Based upon the 47-item Pornography Consumption Effect Scale from Hald & Malamuth (2008), the present study measure of effects of pornography initially

comprised twelve items designed to measure cognitive, affective, and behavioral effects of pornography. Following psychometric scale validation and reliability estimations this was later reduced to seven items (more details below). The item stems are listed in Table 2. Participants were asked to respond to two response sets for each item: (1) a 5-point Likert-type item on the magnitude of the effect, if any, with a response range of 1 = decreased, 3 = no effect, and 5 = increased, and (2) a 5-point Likert-type item on the valence of the effect, if any, with a response range of 1 = very bad, 3 = neither bad nor good, and 5 = very good. We developed composites of the two responses for each item by first recoding the magnitude to range from -2 to 2, with -2 indicating a strong reduction and 2 indicating a strong increase. Second, we used the information on valence (bad or very bad and good or very good) to determine if the reduction or increase on any item was considered positive or negative. As an example, a magnitude of -1 remained -1 if the valence was reported as "bad," and a magnitude of -1 became 1 if the valence was reported as "good". This resulted in a single index ranging from -2 = strong, negative effect to 2 = strong, positive effect with 0 indicating neither a positive nor a negative effect. Participants were assigned a zero if they reported either no effect in terms of magnitude no effect in terms of valence.

Other Measures

Exposure to SEM: Exposure measures to SEM included the age at which participants began consuming SEM, collected as a continuous item and categorized here using the median for comparison groups. A second item was used to ask participants about their preference for condom use during anal intercourse in SEM, with three nominal response options: (1) no condoms, (2) condoms, and (3) no preference. Finally, frequency and duration measures of SEM consumption in the last three months were combined to create an index of the hours per week dedicated to SEM consumption. Four items were used to assess the frequency of accessing SEM through the following four sources: (1) magazines, (2) video/DVD, (3) Internet on a computer, and (4) Internet through a phone or mobile device. Response options to each of these items ranged from 1 = not at all to 6 = more than once a day. One item asked participants to report the typical duration of use of SEM when it was used in the last 90 days, with response categories including: (1) 1 – 15 minutes, (2) 16 – 30 minutes, (3) 31 – 45 minutes, (4) 46 – 60 minutes, (5) between 1 and 1½ hours, (6) between 1½ and 2 hours, and (7) more than 2 hours.

Positive and Negative Affect Schedule (PANAS): The PANAS (25) was used to assess positive and negative affect in the last 90 days. All items were responded to using a 5-point Likert-type index, with 1 = "very little or not at all", and 5 = "extremely". Cronbach's α 0.82 for positive affect and 0.87 for negative affect in this sample.

Social Desirability: We used the Marlowe-Crowne short-form (26) to measure social desirability. This is a standard measure of social desirability that included 10 true/false statements about general characteristics of the participants. The Kuder-Richardson 20 internal consistency estimate for this measure was 0.60. In the test-retest study, the intraclass correlation for the overall score was 0.70. While the internal consistency estimate is below generally-accepted guidelines for reliability, the higher test-retest reliability indicates that reliability is adequate.

Compulsive sexual behavior inventory (CSBI): We used the "control" subscale of the CSBI to assess compulsive, or out-of-control sexual behavior. (31) The subscale comprised 13 items measured using 5-point Likert-type response scales with 1 = "Very frequently" and 5 = "Never." We reversed the valence of the arithmetic mean so that higher scores indicate a stronger manifestation of the construct. Cronbach's α in this sample was 0.90.

Internalized homonegativity (IH): We used the revised Reactions to Homosexuality scale (32) to measure internalized homonegativity. The measure comprised seven, 7-point, Likert-type items to assess the degree to which the items corresponded with the respondents' perceptions of themselves. The response options ranged from 1 = "Strongly disagree" to 7 = "Strongly agree". Cronbach's α in this sample was 0.82.

Sexual self-esteem: We used the sexual confidence and sexual satisfaction subscales of the Multidimensional Sexuality Questionnaire (33) to assess the perceived sexual self-esteem of study participants. The measure included 10, 5-point, Likert-type items with response anchors of 1 = "Not at all like me" to 5 = "Extremely like me". Cronbach's α in this sample was 0.93.

Unprotected anal intercourse with male partners (UAIMP): Participants were asked two items relating to the number of casual male sex partners in the last 90 days with whom they had engaged in unprotected receptive and unprotected insertive anal intercourse. To compare participants who engaged in unprotected anal intercourse to those who did not on the effects of pornography measure, participants who reported one or more UAIMP either as receptive or insertive in the last 90 days were classified as engaging in UAIMP. Participants who reported 0 counts to both items were classified as not engaging in UAIMP.

Statistical methods

Factor analyses and multi-group models—We used the participants from the first survey of test-retest study ($n = 361$) to calibrate and validate the new measure of the effects of pornography. After identifying the optimal solution in the exploratory factor analysis, we subjected the items to a confirmatory analysis to assess the fit of the measurement model to the data and make any necessary model revisions. We used multi-group models between the calibration and validation split-halves from the test-retest study to strengthen the conclusions about the replicability of the measure. For external validation of the scale measure, we estimated a CFA using data from the main study sample ($n = 1,333$) to verify that the measure replicated in an independent sample. To examine construct validity of the final solution, we examined the Pearson correlations between the unit-scaled scores of the effects of pornography measure, the PANAS, the Marlowe-Crowne, the CSBI, the IH measure, and sexual self-esteem. (34–40) Statistical analyses were conducted using StataCorp. Version 11.2. (41) and *Mplus*, Version 6.1.(42)

RESULTS

Table 2 presents the scale items and descriptive statistics for the effects of pornography measure for both the test-retest and main studies. For each study, we provide the composite mean and standard deviation for each item (effect and valence). For both studies, the effect most commonly reported across the items was an increase; this was particularly strong for "knowledge of sex acts," "interest in trying new sexual acts or positions," and "enjoyment of masturbation." "Acceptance of your body" was the only item to have an average response for effect below 0, indicating an overall decrease. The item relating to interest in having unprotected anal intercourse had values of approximately 0 in both studies, indicating no effect, on average. The valence means were similar in direction to the effect means for both studies. Interestingly, the correlation between the effect and the valence measures was generally strong and positive, but not high enough to suggest redundancy of information. The strongest correlations between the effect and valence reports were for "acceptance of your body" and "understanding of your sexual orientation," suggesting that an effect of an increase or decrease on these items often corresponded to an evaluation of this effect as positive or negative, respectively.

The composite item means tended to follow the pattern observed for the reported effects. Overall, the statistics suggest small-to-large positive effects for most of the items. Notable exceptions include “acceptance of your body,” “frequency of seeking sex partners,” and the two items on interest in having protected or unprotected anal intercourse. For all of these items, the means were close to zero, with “acceptance of your body” showing a small, negative effect which was more pronounced in the test-retest study than in the main study.

Exploratory factor analyses indicated that nine items loaded onto two factors. The items on “acceptance of your body” and sex with or without condoms had high uniqueness values thus precluding them from inclusion in the derived factors. In confirmatory factor analysis for this model in the test split-half, two items were found to have high residual covariances with other items in the scale, suggestive of redundancy (Table 3). Removal of these items yielded the final factor solution. For the reworked pornography consumption effects scale (PCES), in the final confirmatory factor analysis, we applied a seven-item, one-factor model to the data from the main study. The model fit indices indicated good model fit, with the exception of the χ^2 statistic, which was statistically-significant (Table 3). Given the bias of this statistic with larger sample sizes (38), we placed more emphasis on the other fit indices in assessing the fit of this model. Table 4 presents the factor loadings and internal-consistency reliability estimates for the final model in both the test-retest and main studies. The factor loadings were moderate to strong, and were very similar between the two studies. The internal-consistency reliability of the final model in each sample was identical at 0.80. More information concerning the psychometric properties of the 7-item PCES is available from the second author.

In Table 5, we present the Pearson correlations between the unit-scaled effects of pornography with the psychometric measures used for external validation and the descriptive statistics of each measure. It is worthy to note that the effect of pornography was neutral to positive (0 to 2) for the majority of participants. Only 3% of participants had a score below zero, indicating very little self-assessed negative effect of pornography in this sample. Given the small number of participants with any self-assessed negative effect ($n = 37$), we were not able to conduct a robust comparison of demographic characteristics with participants with no effect or a positive effect. The items with the strongest negative effect for this subgroup were “attitude toward sex” ($M = -1.03$, $SD = 0.83$) and “enjoyment of masturbation” ($M = -0.61$, $SD = 0.96$). Overall, the measure has better discriminatory power between no effect and a strong, positive effect, than between no effect and a strong, negative effect. However, the discriminatory power for negative effects may increase using other sample types than MSM.

Higher scores on the effects of pornography measure were found to be positively associated with both positive affect ($r = 0.28$) and sexual self-esteem ($r = 0.18$), and negatively associated with internalized homonegativity ($r = -0.17$; Table 5). Scores on the effects of pornography measure were orthogonal to the measures of negative affect, social desirability, and compulsive sexual behavior.

Comparisons of the effects of pornography scores by demographic factors (Table 6) indicated that race/ethnicity, amount of SEM consumption, and education were associated with different levels of the effect score. Latino participants, those who reported a greater amount of SEM consumption, and less-educated participants all reported greater positive effects of pornography. Additionally, while the omnibus F -test for age was not statistically significant, a test for trend using a linear regression model with age treated as an ordinal explanatory variable suggested a statistically-significant decrease in positive effects of pornography as a function of increasing age ($b = -0.04$, $SE = 0.02$, $p = .012$). There were no differences observed as a function of condom use preference in SEM, HIV-serostatus, self-

identification as gay, age at first SEM use, long-term relationship status, or engaging in unprotected anal intercourse.

DISCUSSION

This study of self-perceived effects of SEM consumption found that as much as 97% of MSM report positive effects of SEM consumption on their sexual knowledge, enjoyment of and interest in sex, attitudes toward sex, and understanding of their sexual orientation. Further, SEM consumption was found to be significantly positively associated with consumers' interest in having protected anal intercourse while no significant associations between SEM consumption and consumers' interests in having unprotected anal intercourse was found. Only 3% of the main sample reported any kind of negative effects as a consequence of their SEM consumption.

Positive self-perceived effects of SEM consumption were found to be significantly positively associated with both positive affect and sexual self-esteem and negatively with internalized homonegativity. No significant associations were found between self-perceived effects of SEM and negative affect, social desirability, or compulsive sexual behavior.

The revised version of the Pornography Consumption Effects Scale (PCES) (12) showed excellent psychometric performance in the measure of self-perceived effects of SEM consumption among MSM. The final PCES scale used in the present study consists of 7 items making the scale easily implemented in both research- and applied settings.

Taking the findings at face value, the study results support that SEM consumption amongst MSM may play a positive role in MSMs' sexuality by enhancing their sex life, being a major source of sexual information, providing a recreational sexual outlet, and providing validation, understanding, and confirmation of sexual attraction to men.(5, 24–26) On an individual level, this may be highly significant to some MSM as SEM depicting MSM sexual activities may be one of the primary ways to gain exposure to a number of sexuality-related topics, experiences, information, and behaviors not otherwise readily or easily available.(24, 25) This may also include a fundamental testing and confirmation of one's sexual orientation, sexual attraction to men and/or sexual likes and dislikes.(5)

Self-perceived effects of SEM consumption were found not to be related to unprotected anal intercourse. Instead, participants reported, on average, that more SEM consumption slightly increased their interest in having protected anal intercourse. These findings somewhat mirror recent findings by Wright and Randall's (19) study of heterosexuals, where Internet SEM consumption was found to be unrelated to having unprotected sex, and may be important for a number of reasons.

First, the use of SEM in alternative public health interventions targeting STI related risk behavior among MSM may be warranted. As suggested by Hooper et al. (27) and Rosser et al., (5) adding SEM may have positive effects on the (sexual) health of MSM, while increasing HIV prevention relevancy and re-engaging MSM in HIV prevention. For example, in gay offline sex venues, bars, and clubs and on online sex sites, SEM-based HIV prevention campaigns showing condoms going on penises, as visual media, may be more attention-getting, popular and ultimately effective than written slogans to practice safer sex. Where SEM is shown as part of the venue, ensuring all anal intercourse is depicted with condoms may be helpful in setting and reinforcing safer sex norms. In addition, as new HIV prevention options such as pre-exposure prophylaxis and home testing become available, integrating these as story lines into SEM may be valuable to promote combination HIV prevention.

Second, the results run somewhat counter to the only other existing large scale study of HIV and SEM namely Stein et al.'s (23) cross-sectional Internet questionnaire study of 821 high risk MSM in New York. Stein et al. (23) found that participants with higher percentages of SEM viewing of receptive and insertive unprotected anal intercourse also had significantly elevated odds ratios for engaging such STI related risk behaviors in real life. Further, that viewing SEM depicting unprotected anal intercourse and engaging in unprotected anal intercourse was correlated.(23) Thus, the study of Stein et al. (23) showed SEM consumption to be a risk factor of STI related risk behavior (i.e. anal intercourse) whereas the present study suggests that, if anything, it is protective. One explanation for the seemingly contradictory findings may be different measures of unprotected anal intercourse, with Stein et al. (23) focused on number of unprotected anal intercourse acts, whereas this study measured number of male partners with whom a participant engaged in unprotected anal intercourse. While both are important, we argue that the latter measure is a better proxy measure for risk. Future research should carefully consider what risk measures to employ, and also consider assessing SEM use using multiple measures of HIV/STI risk to clarify the discrepancy between findings.

The key finding that only 3% of participants reported any self-assessed negative effects of SEM consumption should not be accepted uncritically. The phenomenon of biased optimism, referring to the tendency of people to consider themselves less likely to be influenced by negative events than others, (43) may lead to under-reporting or biased perceptions of negative impacts of individual SEM consumption. Thus, given that people generally consider themselves relatively immune to harmful media effects (44) limited negative self-reported effects of SEM consumption may be expected. It may also be due to a response- and attention bias whereby participants' desire for and arousal by SEM leads to negative effects of consumption being minimized or overlooked and positive effects maximized or emphasized.(12) Further, it could be that little negative effects were reported because the PCES did not include questions related to areas in which such effects may be occurring e.g. emotional intimacy or family life more generally.(45) Alternatively, participants may be accurately reporting that there are no negative effects of SEM for most MSM.

The fact that MSM, overall, perceived the effects of SEM to be positive may be interpreted in several ways. On one hand, proponents of SEM argue that since individuals are in the best position to judge subjective effects, (46, 47) these effects and the overall results from studies such as the current one are likely accurate and should be taken at face value. On the other hand critics of pornography see the increasing acceptance of pornography and its seemingly self-perceived "positive" effects as one of the most insidious adverse effects of consumption in that, in their view, such material may in fact not impact positively but rather negatively on attitudes, cognitions, and behaviors.(48) A third interpretation of the findings comes from situating this study in the heterosexual pornography literature. Since a feared negative effect of heterosexual porn is identified as objectification and stereotyping of the opposite gender (49), and since gay SEM typically does not show opposite gender, the results confirm, in a novel way, that after removing the aspect of gender, almost all participants report no negative residual effects. Regardless of interpretation, using two different cohorts of MSM and a valid and reliable measure, this is the first study to document that on average, MSM rate their sexual explicit media use as playing a positive role in their lives. Further, against the concerns of critics of pornography, few report any negative effects, and even fewer, any substantial negative effects.

There are at least three important limitations to this study. First, the main study was cross-sectional, hence we caution the reader against making causal inferences from cross-sectional data. To advance a scientific understanding of the effects of SEM, researchers could propose

longitudinal studies to test SEM effects, although the practical and ethical challenges may be substantial. Second, this is one of only two large survey studies of gay SEM ever published. As such, we lack an adequate body of literature in which to situate our findings. More research is needed to inform such questions as the generalizability of these results. Third, as the study likely include non-probability type samples, the study findings can not be generalized to the MSM population at large.

This study has at least three important implications for future research. First, given the excellent psychometric properties of the revised 7-item Pornography Consumption Effects Scale, we encourage other researchers to consider using it in studies of other populations. This will enable the field to directly compare different populations using the same measures. Second, the near universal self-rating of SEM by MSM to have positive effects, and no negative effects, suggests that SEM-based education holds considerable potential, including in HIV/STI prevention campaigns. Researchers interested in studying the effects of a specific SEM-based intervention might consider adapting the Pornography Consumption Effects Scale to measure the sexually explicit effects of a particular intervention. Third, although only 3% MSM reported negative experiences with SEM, this remains an important group to study. While we were also interested in comparing those with an overall self-perceived negative effect of SEM consumption with those with an overall positive effect of such consumption, the small number of subjects in the negative effect group precludes our ability to make robust inferences. Thus, we encourage future research to include a design that allows for such comparison.

CONCLUSION

Using two large cohorts of American men who have sex with men this cross-sectional study found that MSM generally report positive effects of their consumption of sexually explicit materials in areas related to sexual knowledge, attitudes, behaviors, and orientation. Only as little as 3 % of the sample reported any negative effects. Further, SEM consumption was found to be significantly associated with an increased interest in having protected anal intercourse while not being significantly associated with an interest in unprotected anal intercourse. These finding could have important implications for the sexual health and well-being of MSM by suggesting that SEM-based education and intervention might hold considerable health potential for MSM.

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Table 1

Characteristics of the test-retest and main study samples

Variable	Test-retest (n = 361) %	Main study (n = 1,333) %
Age		
18 – 24	31.02	36.83
25 – 34	32.96	31.06
35 – 44	17.73	15.83
45	18.28	16.28
Race/ethnicity		
NH White	78.95	41.86
NH Black	4.16	11.18
Latino	7.20	29.56
Asian/PI/Other	8.31	17.40
Missing	1.39	0
Education		
Less than college degree	38.78	51.61
College degree or greater	61.22	48.39
HIV-status		
Positive	6.09	9.53
Negative	93.91	90.40
Missing	0	0.08
Identify as gay		
No	11.08	16.05
Yes	76.45	76.97
Missing	12.47	6.98
Age of first SEM use		
< 13 years	44.88	41.19
13 years	54.57	57.84
Missing	0.55	0.98
Condom use preference in SEM		
No condoms	31.58	42.09
Condoms	13.85	16.73
No preference	41.00	41.19
Missing	13.57	0
Amount of SEM viewed, hr/wk		
1	18.84	21.16
>1 – 3.5	30.19	35.33
>3.5 – 7	16.62	19.43
>7	28.25	23.26
Missing	6.09	0.83

Table 2

Descriptive statistics of the 12 items used in the Effects of Pornography measure

Item	Test-retest (n = 361)	Main study (n = 1,333)
	<i>M (SD)</i>	<i>M (SD)</i>
1. Acceptance of your body	−0.17 (1.03)	−0.02 (1.10)
2. Knowledge of sex acts	1.20 (0.87)	1.33 (0.87)
3. Frequency of masturbation	0.53 (1.11)	0.56 (1.12)
4. Attitude toward sex	0.68 (0.98)	0.77 (1.00)
5. Frequency of seeking sex partners	0.12 (0.90)	0.22 (0.94)
6. Interest in trying new sexual acts or positions	1.09 (0.80)	0.97 (0.89)
7. Interest in having protected anal intercourse	0.36 (0.94)	0.40 (0.96)
8. Enjoyment of masturbation	1.10 (0.93)	1.06 (0.98)
9. Understanding of what you like to do sexually	1.12 (0.84)	1.13 (0.87)
10. Interesting in having unprotected anal intercourse	−0.06 (1.00)	0.03 (1.00)
11. Enjoyment of sex with your partner(s)	0.49 (0.87)	0.60 (0.96)
12. Understanding of your sexual orientation	0.99 (0.95)	0.98 (0.96)

Note: All items ranged from −2 to 2, with −2 indicating a strong, negative effect, 2 indicating a strong, positive effect, and 0 representing neither a positive nor a negative effect.

Model fit statistics for split-sample calibration and multi-group testing of the Effects of Pornography measure in the test-retest sample and confirmatory factor analysis in the main study sample.

Table 3

Model	χ^2 , df	p	SCF	CFI	TLI	RMSEA (90% CI)	AIC	BIC	$\Delta \chi^2$, df	p
Training split-half (n = 181)										
9 items, 1 factor	56.83, 27	.001	1.17	0.92	0.89	0.08 (0.05, 0.11)	3951.96	4038.32		
Remove Item 5 ^a	45.34, 20	.001	1.19	0.92	0.89	0.08 (0.05, 0.12)	3495.90	3572.66		
Remove Item 3 ^a	22.39, 14	.071	1.18	0.97	0.95	0.06 (0.00, 0.10)	2991.37	3058.54		
Validation split-half (n = 180)										
CFA of 7 item, 1 factor model	17.71, 14	.220	1.37	0.98	0.97	0.04 (0.00, 0.09)	3054.99	3122.05		
Multi-group models (n = 361)										
Configural	39.75, 28	.070	1.27	0.97	0.96	0.05 (0.00, 0.08)	6046.36	6209.70		
Constrain factor loadings	45.98, 34	.082	1.21	0.97	0.97	0.04 (0.00, 0.07)	6039.51	6179.51	6.72, 6	.345
Constrain factor variance	45.61, 35	.108	1.23	0.98	0.97	0.04 (0.00, 0.07)	6037.67	6173.78	0.00, 1	1.00
Constrain item intercepts	51.72, 41	.122	1.19	0.98	0.98	0.04 (0.00, 0.07)	6031.51	6144.29	6.07, 6	.416
CFA in main study (n = 1,333)	61.86, 14	<.001	1.32	0.97	0.96	0.05 (0.04, 0.06)	22902.81	23011.91		

Note: SCF = scaling correction factor; CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation; CI = confidence interval; AIC = Akaike information criterion; BIC = Bayes information criterion; CFA = confirmatory factor analysis.

^aItems removed iteratively based on high residual covariances with other items in the model which suggests redundancy.

Table 4

Factor loadings and confirmatory factor analysis model-based reliability estimates in the full test-retest and main study samples

Item	Test-retest (n = 361)		Main study (n = 1,333)	
	Loading	Reliability	Loading	Reliability
2. Knowledge of sex acts	0.60	0.80	0.57	0.80
4. Attitude toward sex	0.63		0.65	
6. Interest in trying new sexual acts or positions	0.60		0.60	
8. Enjoyment of masturbation	0.51		0.53	
9. Understanding of what you like to do sexually	0.72		0.76	
11. Enjoyment of sex with your partner(s)	0.53		0.56	
12. Understanding of your sexual orientation	0.63		0.60	

Table 5

Descriptive statistics and correlations between the unit-scaled Effects of Pomography measure and the scores of external validation measures

Measure	Measure number						
	1	2	3	4	5	6	7
1. Effects of pomography	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>	<i>r</i>
2. PANAS, Positive	1.00						
3. PANAS, Negative	0.28*	1.00					
4. Marlowe-Crowne	-0.02	-0.05	1.00				
5. CSBI	0.05	0.13*	-0.28*	1.00			
6. IH	0.00	-0.06*	0.35*	-0.24*	1.00		
7. Sexual self-esteem	-0.17*	-0.13*	0.15*	-0.07*	0.31*	1.00	
	0.18*	0.29*	-0.33*	0.26*	-0.22*	-0.31*	1.00
<i>N</i>	1,333	1,257	1,257	1,258	1,258	1,246	1,247
<i>M (SD)</i>	0.98 (0.63)	3.41 (0.82)	2.19 (0.88)	5.32 (2.09)	2.06 (0.76)	2.44 (1.23)	3.16 (0.97)
Range	-1.71, 2	1, 5	1, 5	0, 10	1, 5	1, 6.43	1, 5

Note: *r* = Pearson product-moment correlation coefficient; PANAS = Positive and negative affect schedule; Marlowe-Crowne = Social desirability scale; CSBI = Compulsive sexual behavior inventory; IH = internalized homonegativity.

* $p < .05$

Table 6

Comparison of means on the unit-scaled Effects of Pornography measure by demographic and outcome variables.

Variable	<i>n</i>	<i>M</i> (<i>SD</i>)	<i>F</i>	<i>df</i>
Age				
18 – 24	491	1.03 (0.64)	2.47	3, 1329
25 – 34	414	0.96 (0.63)		
35 – 44	211	0.97 (0.63)		
45	217	0.90 (0.63)		
Race/ethnicity				
NH White	558	0.92 (0.62) ^a	4.24 ^{**}	3, 1329
NH Black	149	0.93 (0.66)		
Latino	394	1.06 (0.65) ^a		
Asian/PI/Other	232	1.01 (0.61)		
Condom use preference in SEM				
No condoms	561	0.98 (0.64)	0.11	2, 1330
Condoms	223	0.99 (0.65)		
No preference	549	0.97 (0.62)		
Amount of SEM viewed, hr/wk				
1	282	0.83 (0.62) ^{a,b}	11.37 ^{***}	3, 1318
>1 – 3.5	471	0.97 (0.60) ^{a,c}		
>3.5 – 7	259	0.97 (0.62) ^d		
>7	310	1.13(0.66) ^{b,c,d}		
			<i>t</i>	<i>df</i>
Education				
Less than college degree	688	1.02 (0.64)	2.58 [*]	1331
College degree or greater	645	0.93 (0.61)		
HIV-status				
Positive	127	0.98 (0.63)	1.40	1330
Negative	1,205	0.90 (0.66)		
Identify as gay				
No	214	0.93 (0.65)	–1.23	1238
Yes	1,026	0.99 (0.62)		
Age of first SEM use				
< 13 years	549	0.97 (0.64)	–0.58	1318
13 years	771	0.99 (0.62)		
In a long-term relationship				
No	679	1.00 (0.62)	–0.38	1087
Yes	410	1.01 (0.63)		
Engage in unprotected anal intercourse with casual partners in the last 90 days				
No	861	0.99 (0.62)	0.10	1237

Variable	<i>n</i>	<i>M (SD)</i>	<i>F</i>	<i>df</i>
Yes	378	0.98 (0.64)		

Note: One-way analysis of variance with Scheffe correction used to compare the means for variables with three or more categories; Student's t-test with equal variances used for dichotomous variables.

*
 $p < .05$;

**
 $p < .01$;

 $p < .001$

a, b, c, d Indicate pairs with statistically-significant differences in post-hoc pairwise comparisons ($p < .05$).