Pornography Use and Sexual Aggression: The Impact of Frequency and Type of Pornography Use on Recidivism Among Sexual Offenders

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In this study, we examined the unique contribution of pornography consumption to the longitudinal prediction of criminal recidivism in a sample of 341 child molesters. We specifically tested the hypothesis, based on predictions informed by the confluence model of sexual aggression that pornography will be a risk factor for recidivism only for those individuals classified as relatively high risk for re-offending. Pornography use (frequency and type) was assessed through self-report and recidivism was measured using data from a national database from the Royal Canadian Mounted Police. Indices of recidivism, which were assessed up to 15 years after release, included an overall criminal recidivism index, as well as subcategories focusing on violent (including sexual) recidivism and sexual recidivism alone. Results for both frequency and type of pornography use were generally consistent with our predictions. Most importantly, after controlling for general and specific risk factors for sexual aggression, pornography added significantly to the prediction of recidivism. Statistical interactions indicated that frequency of pornography use was primarily a risk factor for higher-risk offenders, when compared with lower-risk offenders, and that content of pornography (i.e., pornography containing deviant content) was a risk factor for all groups. The importance of conceptualizing particular risk factors (e.g., pornography), within the context of other individual characteristics is discussed. Aggr. Behav. 34:1–11. 2008.   © 2008 Wiley-Liss, Inc.

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INTRODUCTION

The influence of pornography on sexual aggression has been a longstanding question that has provoked considerable debate amongst professionals working with sexual offenders [Lalumière et al., 2005; Seto and Eke, 2005; Seto et al., 2001]. Given the exponential growth and accessibility of pornographic material [Malamuth et al., 2000], evidence for or against a link between such material and aggression would be important to public policy debates and legislation, as well as the assessment and treatment of sexual offenders [Seto et al., 2001].

Pornography's influence on sexually aggressive behavior has been examined at both the population and individual levels [Seto et al., 2001]. The former method explores the relationship between the availability of pornography and fluctuations in the incidence of sexual crimes [Kimmel and Linders, 1996; Kutchinsky, 1991], whereas the latter examines the association between pornography use and

the likelihood of sexual aggression within individuals. Analyses at the population level have produced equivocal results [Court, 1976; Kutchinsky, 1991] and several methodological problems have been identified [see Malamuth and Petipitan, 2007 for a review]. In brief, such criticisms have focused on the problematic approach of drawing conclusions about individuals from societies at large, in addition to the lack of emphasis placed on important moderator variables (e.g., cultural variability, type of pornography) and the influence these may have

on individual susceptibility to sexually explicit material [see Malamuth et al., 2000; Malamuth and Huppin, 2005; Seto et al., 2001].

At the individual level, pornography's presumed role in sexual aggression has been examined using analog measures of aggressive behavior (e.g., administration of electric shock) and correlating self-reported use of pornography with official records of aggressive behavior [e.g., recidivism; Marshall, 1988; Seto and Eke, 2006].

In a meta-analysis of 33 studies ($N = 2,040$), Allen et al. [1995a] examined the association between pornography and nonsexual aggression using prototypical analog measures of aggressive behavior. The analysis divided sexually explicit material into one of the following three categories: (a) nudity, (b) nonviolent sexual behavior, and (c) violent sexual behavior. Overall, results indicated an association between pornography and aggression. However, type of pornography was a moderator, such that exposure to nudity decreased aggression, whereas exposure to the latter two categories significantly increased aggression.

Within naturalistic settings, pornography's influence on aggression has been explored in both offender and nonoffender populations [Hald et al., 2007; Seto and Eke, 2005, 2006]. In noncriminal populations, Malamuth et al. [2000] examined the relationship between frequency of pornography use and sexual aggression in a representative sample of men ($n = 2,972$). Results indicated that pornography use was positively correlated with coercive sexual behavior and was predictive of sexual aggression. These findings have been supported in other studies demonstrating a significant relationship between a higher frequency of pornography use and type of use (i.e., deviant images) with sexual aggression [e.g., Boeringer, 1994; Vega and Malamuth, 2007]. However, as noted below, follow-up analyses demonstrated that the association between pornography and sexual coercion was largely based on those individuals assessed as high risk to offend sexually.

In known groups of sexual offenders, pornography use has been assessed in terms of frequency and type of pornography used. However, much of this research has been equivocal. With regard to frequency of pornography consumption, for example, there has been some evidence suggesting that sexual offenders obtain and view more pornography [Abel, 1985; Marshall, 1988] than nonoffender control samples, whereas others have found either no difference between groups [Condron and Nutter, 1988], or that the comparison groups reported more pornography use than sexual offenders [Cook et al., 1971].

Pornography's influence on sexual crime has also been examined in sexual offender populations, specifically. Indeed, a significant proportion of offenders in studies described by Abel [1985] and Marshall [1988] reported being influenced to sexually offend, as a result of viewing pornography. Interestingly, the type of pornography that was related to sexually aggressive behavior in Marshall's study involved consensual depictions, suggesting that content of pornography may be less important with respect to sexual aggression [Marshall et al., 1991]. In fact, it has been suggested that individuals, particularly those demonstrating a propensity toward violence, may exhibit deviant fantasies, which can be elicited from various consensual depictions [Marshall, 1988, 2000]. However, of note, the specific content of pornography is often difficult to elucidate, as such material may include content representing both "nondeviant" and "deviant" forms [Malamuth et al., 2000].

The research summarized above generally indicates that pornography consumption is associated with adverse behaviors under some conditions and complements additional controlled research that supports such an effect [see Malamuth et al., 2000; Vega and Malamuth, 2007, for summaries]. However, it is clear that many individuals view pornography and do not act out aggressively in interpersonal contexts.

It has been suggested that the negative effects of pornography are associated with certain individuals based on the complex interaction with particular individual and cultural differences [Malamuth et al., 2000; Malamuth and Petipitan, 2007]. Relevant moderating variables may include, but are not limited to, a family background which fosters the development of inappropriate attitudes and schema involving women, as well as more proximal factors, such as transient emotional states (e.g., anger). It is these factors, for example, that place certain individuals at greater risk for experiencing a negative impact from pornography exposure.

Of particular relevance to the current research, pornography's influence on aggressive behavior has been examined within the context of pretest measures of risk characteristics (i.e., risk to offend sexually and violently). Most of the research investigating the interaction effects between pornography and other variables has been conducted under the organizational framework of the Hierarchical-Mediational Confluence model [HMC;

Malamuth, 1986; Malamuth et al., 2000; Malamuth and Huppin, 2005; Vega and Malamuth, 2007].

In brief, the HMC model was constructed from research demonstrating that sexual aggressors possess several key characteristics, which are present both developmentally and at the time of aggression. These predictor variables operationalize two proposed pathways to sexual coercion. The first is hostile masculinity ,which refers to a constellation of personality traits, combining a hostile orientation, typically toward women and satisfaction obtained through dominating, humiliating, and controlling women. The second pathway is impersonal sex and describes a noncommittal, game-playing orientation toward sexual activity and describes individual differences in the willingness to engage in such acts without closeness or commitment [Malamuth, 1998, 2003; Malamuth et al., 1995].

As opposed to a path-oriented model, where the presence of a specific factor directly determines the criterion of interest, the HMC model provides both a cumulative and conditional-probability explanation for the causes of sexually aggressive behavior. In other words, the HMC model highlights the importance of investigating a particular predictor (e.g., pornography) within the context of other variables (e.g., pretest measures of risk characteristics) and this allows for the inclusion of relevant moderating variables in a predictive model.

The relationship between pornography and sexual aggression has been investigated according to the conditional-probability approach suggested by the HMC model in noncriminal sexual aggressors [i.e., college students who self-report using sexual coercion; see Malamuth et al., 2000; Vega and Malamuth, 2007]. These investigators classified participants into varying levels of risk to behave in a sexually coercive manner, based on the HMC model's dimensions described above, and examined the predictive utility of pornography use. Results indicated that pornography was a significant additional predictor of sexual aggression, after controlling for the other risk factors described by the model and that frequency of pornography use was only a risk factor for individuals assessed to be "at relatively high risk" for perpetrating sexual aggression [Malamuth et al., 2000; Vega and Malamuth, 2007]. Specifically, this research highlighted an interaction effect, in which individuals classified as low risk demonstrated a small association between frequency of pornography use and sexual aggression, whereas high-risk men showed a large effect between pornography and sexual aggression. With respect to attitudes, Hald et al. [2007]

obtained similar results, such that individuals assessed as low or moderate risk for aggression demonstrated no effect between frequency of pornography use and negative attitudes toward women, whereas the highest risk group demonstrated a significant relationship.

The purpose of this study was to evaluate the role of pornography as a risk factor for aggression and to extend the findings of Malamuth and others—that is, to examine whether pornography use is a significant predictor of sexual aggression, when moderated by general and specific risk characteristics. As such, we hypothesized that pornography use would be a risk factor for recidivism only for those individuals classified as relatively high risk for re-offending. This hypothesis was tested using the following three classifications of recidivism: (1) all criminal recidivism, (2) violent (including sexual) recidivism, and (3) sexual recidivism only (see below for operational definitions).

In naturalistic settings, it is difficult to operationalize distinctions across type of pornography content, as it is difficult to differentiate deviant and nondeviant forms of sexually explicit material. This has led some [see Malamuth et al., 2000; Vega and Malamuth, 2007] to focus on self-reported frequency of general pornography use (e.g., consumption of sexually explicit magazines, which has shown to be strongly correlated with the use of other types of pornography). As such, the main analyses in this study focused on frequency of pornography use, irrespective of the type of content. However, additional analyses were conducted to explore the relationship between the type of content (i.e., deviant pornography) and aggression.

Currently, research pertaining to pornography use and aggression, moderated by individual risk factors, has utilized noncriminal populations (i.e., college students) and, as such, has neglected individuals with an official history of sexual coercion (i.e., sexual offenders). Moreover, most studies have predominantly used cross-sectional research designs, and thus, longitudinal data pertaining to the relationship between pornography and aggression have been noticeable limited. This paper addressed both of these limitations.

METHOD

Participants

Participants were adult men who had been convicted of a hands-on sexual offence against an individual under the age of 16 at the time of the

offence ($N = 341$). The average age of the sample was 39.6 years (range: 18–78; $SD = 12.0$). The sample consisted of 211 (61.9%) intrafamilial child molesters and 130 (38.1%) extra-familial child molesters. The average education level of this sample was 11.61 years ($SD = 3.76$ years). Of the 341 participants, 49% had previous charges or convictions for criminal offences, 32.8% had previous charges or convictions for violent (including sexual) offences, and 23% had previous charges or convictions for sexual offences.

The participants were assessed at a university teaching hospital in a large Canadian city between 1982 and 1992. If police records indicated that a participant had ever offended against an adult, they were excluded from the analyses. Participants with both related and unrelated victims were not available in this database. All participants signed a consent form at the time of assessment permitting use of their data for research, which was conducted in compliance with the internal review board of the hospital. Portions of this sample have been examined in other studies [see Firestone et al., 1999, 2006; Kingston et al., 2007; Nunes et al., 2002], but the relationship between pornography and recidivism was not investigated.

Measures

Static 99.   The Static 99 [Hanson and Thornton, 1999] is a brief actuarial instrument designed to predict the long-term probability of sexual recidivism among adult male sexual offenders. The ten items were derived from the Rapid Risk Assessment for Sex Offence Recidivism [Hanson, 1997] and the Structured Anchored Clinical Judgment—Min [Grubin, 1998] and include earlier sex offences, earlier sentencing dates, noncontact sex offense convictions, nonsexually violent index offence convictions, earlier nonsexual violent convictions, unrelated victims, stranger victims, male victims, ever lived with a lover for 2 years, and age. The overall score is translated into one of the four risk categories: low (0,1); medium–low (2,3); medium–high (4,5); and high [6–12; Hanson and Thornton, 2000]. The Static 99 has demonstrated excellent interrater reliability in several studies [de Vogel et al., 2004; Doren, 2004; Hanson, 2001; Harris et al., 2003], as well as good concurrent validity [Roberts et al., 2002]. Recently, Hanson and Morton-Bourgon [2004] pooled the results of 21 studies ($n = 5,103$ sexual offenders) and found the Static 99 to have moderate predictive accuracy for sexual

recidivism ($d = 0.63$) and violent recidivism ($d = 0.57$).

Scoring of the Static 99 adhered to the coding guidelines provided by Hanson and Thornton [1999] and was based on information gathered earlier to an individuals release date. However, there were some deviations from the coding rules and these have been outlined in detail elsewhere [see Nunes et al., 2002]. To provide an example, the item, "ever lived with a lover for 2 years" was coded based on the indication that the offender had cohabitated with an intimate partner (i.e., been married), irrespective of the amount of time the couple had lived together. As such, the measure is best described as a modified version. It should be noted that such modifications did not detract from this instrument's predictive validity using a similar sample [Nunes et al., 2002].

Analyses were carried out using the risk categories, "low," "moderate-low," and "moderate-high," as described by Hanson and Thornton [1999]. The highest risk category (i.e., "high risk") was excluded from the analyses, given the small number of participants allocated to this category ($n = 4$). Throughout this paper, these categories will be referred to as low, medium, and high, respectively. This reclassification was done to avoid awkwardness and to compare risk levels within this sample. The reader should be aware that any reference to medium and high risk in this paper is equivalent to the moderate-low- and moderate-high-risk categories in the Static 99, respectively. The average score on the Static 99 for this sample was low (Mean = 1.4; $SD = 1.65$).

Bradford Sexual History Inventory.   Self-reported pornography use was collected at the time of assessment using the Bradford Sexual History Inventory [Bradford et al., 1987, 1991]. This inventory, which is completed by participants during an initial psychiatric interview, consists of 81 items grouped into nine categories and inquires about an individual's sexual activity. For this study, questions pertaining to pornography use were of importance. Specifically, individuals were asked to rate the frequency with which they had viewed sexually explicit films and/or books over the course of their lifetime. The corresponding response categories were 0, 1, 2–5, 6–10, 11–50, 51–100, 101–200, and more than 200. Each category was coded on a 1 to 8 scale with 8 representing the most frequent category (more than 200). Next, the individuals responded to a question concerning the type of pornography used and response categories were (1) heterosexual sex, (2) homosexual sex, (3) lesbian sex, (4) children engaged in sexual activity, and (5) depictions of

violence. Individuals could check more than one type of pornography used and deviance was defined as any self-reported use of pornography containing children and/or violence.

Recidivism analyses. The dependent measures in this study were organized in a cumulative hierarchical manner, beginning with a comprehensive category that included all types of recidivism, followed by more specific categories of recidivism. This classification method is similar to other studies and thus, allows for comparison across studies [see Firestone et al., 1999, 2006; Rice et al., 1991]. Moreover, this cumulative hierarchical approach allows for the inclusion of sexually motivated offenses that were "pled down" to violent or criminal offences as many sexual offenders would rather admit to any offence other than a sexual offence. Evidence of recidivism was obtained from the Canadian Police Information Center's report, a national database of criminal arrests and convictions from the Royal Canadian Mounted Police. The subcategories were as follows: (1) all criminal recidivism was used as the comprehensive overall measure of recidivism, which included any charge or conviction noted in the Canadian Police Information Center report (i.e., criminal, violent, and/or sexual); (2) violent (including sexual) recidivism was defined as any charge or conviction of a violent and/or sexual offence (e.g., assault, assault causing bodily harm); and (3) sexual recidivism was defined as any charge or conviction of a sexual offence (e.g., invitation to sexual touching).

Specifically, the proportion of recidivists was calculated as a function of all new offences, regardless of when these offences occurred during the follow-up period. In this study, it should be stressed that recidivists are those men who have been charged or convicted of re-offending, and therefore these rates are approximations of true re-offense rates, as some men who committed these acts would not have been apprehended.

The overall rates of recidivism in this study were 31.7% for criminal recidivism, 21.4% for violent recidivism, and 11.1% for sexual recidivism. The recidivism rates for the intrafamilial child molesters were 24.2%, 17.1%, and 8.1%, for criminal, violent, and sexual offences, respectively. The recidivism rates for the extra-familial child molesters were 43.8%, 28.5%, and 16.2%, for criminal, violent, and sexual offences, respectively. The follow-up period was assessed on release to the community and ranged up to 15 years, with an average of 8.4 years ($SD = 4.0$ years).

Statistical analyses. For this study, sequential logistic regression analyses were conducted to analyze the relationship between pornography use and recidivism and to address the possibility that an individual's risk level would be a moderator of this relationship.

To address the strength of the relationships in these analyses, Cohen's *d* and odds ratios were reported. By convention, Cohen's *d* effect sizes of .20, .50, and .80 are small, medium, and large, respectively [Cohen, 1988, 1992]. Additionally, 95% confidence intervals (CI) around *d* were provided to indicate the range of values that would be expected in 95% of other samples utilizing the same population of sexual offenders. Values of *d* are considered statistically significant if the 95% CI does not contain zero. Finally, when comparing effect sizes (see Fig. 1), values of *d* are significantly different from one another when their 95% CIs are not overlapping. Odds ratios, as reported in the regression analyses, can be interpreted as the increase or decrease in the predicted odds of recidivism, which corresponds to an increase of one point on the predictor variable (e.g., frequency of pornography use), or in the case of a dichotomous predictor (i.e., deviant pornography), the odds of recidivism in one group compared with the other. An odds ratio of 1 reflects no relationship between a predictor and a outcome.

A series of sequential logistic regression analyses were conducted for each dependent measure to test the importance of the conditional-probability approach described by the HMC model in general and examining risk to re-offend, as a moderator between pornography use and recidivism, in particular. Specifically, pornography and risk level were entered as independent variables. Consistent with Vega and Malamuth [2007], we divided pornography use into low, medium, and high frequency of use. Specifically, scores below the median (i.e., scores of 1–3), were assigned into the low-use category ($n = 116$). Individuals scoring between 4 and 5 ($n = 147$) were assessed as moderate users, and finally, the remaining individuals were assessed as high users (i.e., scores of 6–8; $n = 78$).

RESULTS

All Criminal Recidivism

As can be seen in Table I, Static 99 score made a significant contribution to the prediction of all recidivism (χ^2 change $= 15.61$, df $= 1$, $P < .001$), but frequency of pornography use did not (χ^2 change $= .512$, df $= 1$, $P = .474$). The interaction
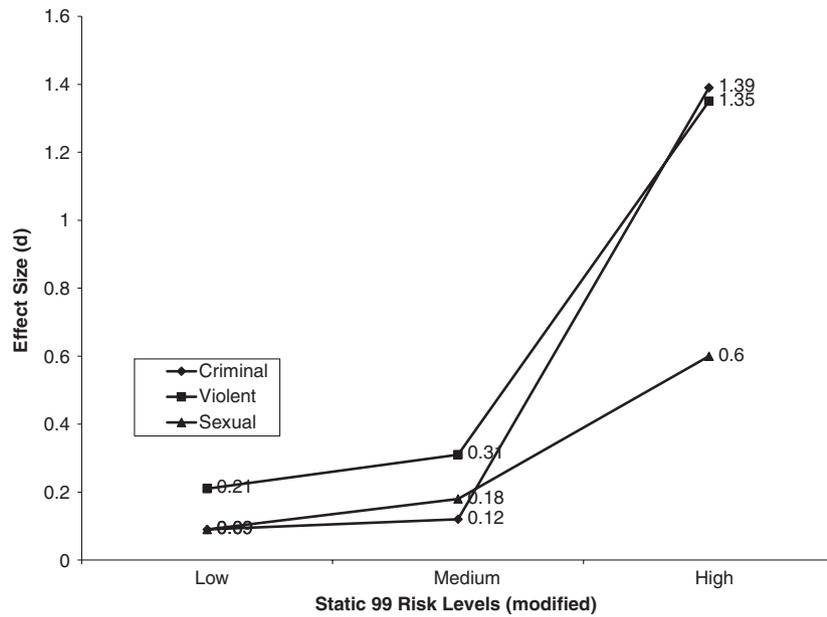
Fig. 1. Relationship between frequency of pornography use (continuous) and recidivism, as a function of risk to commit sexual aggression.

TABLE I. Logistic Regression Analysis for Risk and Pornography Use Predicting Criminal Recidivism

| | β | SE | e^b | 95% CI for e^b | | χ² change from previous block |
				Lower	Upper	
Block 1						15.61***
Static 99	.841	.219	2.34	1.51	3.56	
Block 2						.512
Static 99	.820	.221	2.27	1.47	3.50	
Pornography use	.146	.204	1.16	.78	1.73	
Block 3						6.57*
Static 99	−.811	.694	.444	.114	1.73	
Pornography use	−1.10	.544	.333	.115	.967	
Interaction	.828	.340	2.29	1.18	4.45	

CI, confidence interval.
*$P < .05$; **$P < .01$; ***$P < .001$.

between risk level and pornography use was significant (χ^2 change = 6.57, df = 1, $P < .05$), suggesting that the relationship between pornography use and recidivism was different across levels of risk.

Violent (Including Sexual) Recidivism

As can be seen in Table II, Static 99 risk level made a significant contribution to the prediction of violent (including sexual) recidivism. In Block 2, the addition of pornography use made a significant contribution to recidivism, after controlling for Static 99 risk level (χ^2 change = 4.48, df = 1, $P < .05$). In the third block, the pornography by Static 99 risk-level interaction was significantly associated with the prediction of recidivism

(χ^2 change = 4.72, df = 1, $P < .05$), suggesting that the relationship between pornography use and recidivism was different across levels of risk.

Sexual Recidivism

As indicated in Table III, Static 99 risk level made a significant contribution to the prediction of sexual recidivism. Frequency of pornography use was added in Block 2 and did not make a significant contribution to the prediction of sexual recidivism, after controlling for Static 99 risk level (χ^2 change = 1.85, df = 1, $P = .174$). The interaction between Static 99 and pornography use was also not significant (χ^2 change = 1.28, df = 1, $P = .259$).

TABLE II. Logistic Regression Analysis for Risk and Pornography Use Predicting Violent (Including Sexual) Recidivism

	β	SE	e^b	95% CI for e^b		χ² change from previous block
				Lower	Upper	
Block 1						12.11**
Static 99	.782	.225	2.19	1.41	3.40	
Block 2						4.48*
Static 99	.726	.229	2.07	1.32	3.24	
Pornography use	.479	.229	1.61	1.03	2.53	
Block 3						4.72*
Static 99	−.838	.794	.433	.091	2.05	
Pornography use	−.695	.599	.499	.154	1.61	
Interaction	.754	.366	2.13	1.04	4.35	

CI, confidence interval.
*$P<.05$; **$P<.01$; ***$P<.001$.

TABLE III. Logistic Regression Analysis for Risk and Pornography Use Predicting Sexual Recidivism

	β	SE	e^b	95% CI for e^b		χ² change from previous block
				Lower	Upper	
Block 1						4.91*
Static 99	.618	.272	1.85	1.09	3.16	
Block 2						1.85
Static 99	.565	.276	1.76	1.03	3.02	
Pornography use	.388	.288	1.48	.839	2.59	
Block 3						1.28
Static 99	−.412	.935	.662	.106	4.14	
Pornography use	−.351	.717	.704	.173	2.87	
Interaction	.452	.408	1.57	.707	3.50	

CI, confidence interval.
*$P<.05$; **$P<.01$; ***$P<.001$.

Interaction Between Pornography and Risk to Re-Offend

The above analyses provided support for the hypothesis that propensity toward sexual aggression moderates the relationship between pornography use and aggression [see Malamuth et al., 2000; Vega and Malamuth, 2007]. To further examine these interactions, effect sizes were displayed across Static 99 risk categories (i.e., the redefined low, medium, and high-risk categories) and examined with respect to frequency of pornography use (using the 1–8 scale). The effect sizes shown in Figure 1 highlight the interaction indicated in the previous analyses, such that individuals assessed as low risk ($n = 135$) demonstrated small associations between criminal ($d = .09$, 95% CI $= −.15$–.33), violent ($d = .21$, 95% CI $= −.03$–.45), sexual ($d = .09$, 95% CI $= −.15$–.33) recidivism, and the frequency of pornography use. Individuals assessed as medium risk ($n = 51$) demonstrated small but elevated associations between frequency of pornography and criminal ($d = .12$, 95% CI $= −.27$–.50), violent ($d = .31$, 95% CI $= −.08$–.69), and sexual ($d = .18$, 95% CI $= −.21$–.57) recidivism. Finally, individuals assessed as high risk in our analysis ($n = 22$) demonstrated moderate to large effect sizes between frequency of pornography use and criminal ($d = 1.39$, 95% CI $= .73$–2.00), violent ($d = 1.35$, 95% CI $= .69$–2.00), and sexual ($d = .60$, 95% CI $= −.01$–1.20) recidivism. As evidenced by the CIs, there were significant differences between individuals assessed as high risk and low risk for criminal and violent recidivism.

Additional Analyses Regarding Pornographic Content

Of the 341 child molesters in this study, 337 responded to questions pertaining to type of content. Among these individuals, 303 (90%) reported viewing only nondeviant pornography,

whereas 34 (10%) indicated viewing deviant pornography. The use of deviant pornography was unrelated to risk level ($r = .07$, $P = .323$). Given the few participants within the recidivist categories, caution is warranted when interpreting these results. Nevertheless, to highlight possible trends, a series of logistic regression analyses were conducted to test for possible interactions between the three-level hierarchical risk variable and the two-level type of content variable on the dependent measures. With regard to criminal recidivism, risk level made a significant contribution to the prediction of recidivism in Block 1 (χ^2 change = 14.36, df = 1, $P < .001$). The addition of pornography content into the equation was significant, after considering risk level (χ^2 change = 4.99, df = 1, $P < .05$). The odds ratio indicated that for individuals who viewed deviant pornography, the predicted odds of criminal recidivism increased by 177% when compared with those who did not view deviant pornography. The interaction between risk level and type of pornography was not significant (χ^2 change = .293, df = 1, $P = .588$). In terms of violent (including sexual) recidivism, risk level made a significant contribution to the prediction of recidivism in Block 1 (χ^2 change = 11.62, df = 1, $P < .01$). The addition of type of pornography was significant, after controlling for risk level (χ^2 change = 4.94, df = 1, $P < .05$). The odds ratio indicated that for individuals who viewed deviant pornography, the predicted odds of violent (including sexual) recidivism increased by 185% when compared with those who did not view deviant pornography. The interaction between risk level and type of pornography was not significant (χ^2 change = .999, df = 1, $P = .317$). Finally, both risk level (χ^2 change = 4.46, df = 1, $P < .05$) and pornography content (χ^2 change = 4.83, df = 1, $P < .05$) made significant contributions to the prediction of sexual recidivism for Blocks 1 and 2, respectively. The odds ratio indicated that for individuals who viewed deviant pornography, the predicted odds of sexual recidivism increased by 233% when compared with those who did not view deviant pornography. The interaction between these variables was not significant (χ^2 change = 1.11, df = 1, $P = .292$).

DISCUSSION

The purpose of this study was to examine the relationship between pornography and aggressive behavior within the context of an important moderating variable—that is, risk to re-offend [Malamuth, 2003]. According to recent investigations, the predictive utility of pornography is based on the interaction between various risk characteristics associated with aggression [Malamuth et al., 2000], and individuals who view sexually explicit material are more likely to offend and/or re-offend when they possess such characteristics [Hald et al., 2007; Vega and Malamuth, 2007]. The results of this study supported the utility of pornography as a predictor of aggression, when examined in confluence with other general and specific risk factors for aggression.

We examined the impact of frequency of pornography use on the overall comprehensive measure of criminal recidivism, as well as the more specific categories of violent (including sexual) recidivism and sexual recidivism only. Results indicated that the frequency of pornography use contributed to the prediction of criminal and violent recidivism, while taking other risk factors for sexual aggression into account. Follow-up analyses indicated that the interaction between pornography and risk to re-offend was consistent with the conditional-probability model outlined in the HMC model. Specifically, we found that among men who scored high on general and specific risk characteristics, frequent pornography consumption increased the risk for aggression. In contrast, amount of pornography use had little predictive value for men assessed to be at low risk for sexual aggression.

The predictive utility of pornography use among high risk, as opposed to low-risk individuals, has been explained by social learning theory in general, and the notion of reciprocal determinism, defined as the interaction between person, behavior, and environment, in particular [Malamuth and Huppin, 2005; Seto et al., 2001]. Specifically, individuals with a predisposition for aggression (i.e., men who are at relatively high risk for aggression) have shown to be particularly drawn to images of pornography and are more likely to expose themselves in the future to such images than lower-risk individuals [Shim et al., 2007]. Moreover, a number of priming studies have shown that men with earlier risk characteristics may interpret sexually explicit material differently than lower-risk individuals, such that pornography activates and reinforces inappropriate cognitive representations (e.g., hostility toward women) and fosters the development of sexual preoccupation in these men [see Malamuth et al., 2000 for a review]. Given that both of these factors are related to future sexual aggression [Hanson and Morton-Bourgon, 2004], it is not surprising that men who were assessed as relatively high risk for sexual aggression and who

were frequent users of pornography were more likely to behave aggressively compared with lower-risk offenders.

Of note, the main effects and interactions between frequency of pornography use and sexual recidivism were not significant. This was somewhat surprising given research suggesting that pornography use is associated with sexual coercion [e.g., Malamuth et al., 2000], and that the observed interactions between pornography use and risk to re-offend have been demonstrated for this type of behavior [Vega and Malamuth, 2007].

Importantly, however, the interaction was significant for violent (including sexual) recidivism, which we feel is a better representation of the influence of pornography on sexually aggressive behavior. In fact, several investigators have argued that using violent (including sexual) recidivism is the most accurate outcome criterion when interested in sexual recidivism, given the tendency of the former to "capture significantly more sexual re-offenses than the more commonly used sexual recidivism definition" [Quinsey et al., 1998, p. 129]. Recently, this was demonstrated empirically [Rice et al., 2006] in a comparison of 177 police *rapsheets* (official documentation regarding charges and convictions) with more detailed clinical case reports. Results indicated that approximately 33% of offenders for whom no sexual motivation was indicated had most likely committed a sexually motivated crime.

The findings indicated by Rice et al. supports using violent (including sexual) recidivism as the most reliable outcome measure when interested in sexually motivated offences. As such, the significant interaction found among violent (including sexual) recidivists in our study replicates and extends the findings of Malamuth et al. [2000] and Vega and Malamuth [2007] indicating that individual risk is an important variable moderating the relationship between pornography and sexual aggression.

Next, we examined the degree to which self-reported use of deviant pornography was predictive of the overall comprehensive measure of criminal recidivism, as well as the more specific categories of violent (including sexual) recidivism and sexual recidivism. Results supported a main effect of pornographic content, after controlling for general and specific risk characteristics, as contained in the Static 99. Specifically, results indicated that individuals who viewed deviant pornography were more likely to recidivate when compared with individuals who did not view deviant pornography

and this difference was consistent across levels of risk (i.e., no interactions).

There is a growing body of literature investigating the impact of exposure to deviant pornography on attitudes supportive of sexual aggression [Allen et al., 1995a,b; Malamuth and Check, 1981], physiological arousal to sexual aggression [Malamuth et al., 2000; Marshall et al., 1991; Seto et al., 2006], and actual aggressive behavior among nonoffenders [Malamuth et al., 2000]. Thus far, results have generally supported the negative impact from viewing deviant pornography on these outcome measures and our findings were consistent with such results. Both observational learning and conditioning processes suggest that repeated exposure to deviant forms of pornography, given the focus on male entitlement and power, help shape an individual's fantasies, perceptions, rationalizations, and deeper core beliefs [Lalumière et al., 2005; Marshall, 2000; Seto et al., 2001]. It is important to note that such development is most likely multifaceted and that pornography may simply accelerate a process that is already underway [Marshall, 2000]. Of equal importance, however, is that the impact of deviant pornography on behavior was consistent across levels of risk. This suggests that exposure to unconventional sexual activity fosters the progression toward re-offending, regardless of the earlier existence of historical risk factors. In contrast, frequency of pornography use, as indicated above, was a predictor for individuals already possessing such a predisposition toward re-offending.

Several issues must be considered when interpreting these results. First, the assessment of pornography was problematic, as it was based solely on self-report and required individuals to recall information over the course of their life times. Regarding the first point, individuals undergoing assessment in a forensic setting are sometimes reluctant to be forthcoming with information, especially when such information could have negative consequences for their evaluation. This type of limitation is consistently identified in forensic research [e.g., Nugent and Kroner, 1996]. Additionally, individuals were asked to recall information spanning much of their lifetime and problems with adequate retrieval of early events may have influenced the results. A final problem regarding the assessment of pornography use pertained to the type of pornographic stimuli examined. In other words, the type of pornography involved films and/or books and thus neglected Internet pornography. Unfortunately, given the dates of assessment (1982–1992), this was not

possible and future research should examine similar questions pertaining to individuals who use the Internet to obtain sexually explicit material.

In spite of these limitations, this current research supported and extended the results reported by other studies with noncriminal sexual aggressors indicating that pornography exposure was a significant predictor of aggression when examined in confluence with other risk factors. Specifically, this study highlighted the importance of considering various interactive factors that can act synergistically in determining the probability for a particular behavioral outcome. The important implications of the cumulative-conditional-probability conceptualization, as described in research investigating the HMC [Malamuth et al., 2000], is not limited to pornography use but has important implications for examining the complex relationships between distal and proximal factors as predictors of sexual aggression.

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