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Neil M. Malamuth, Tamara Addison & Mary Koss

To cite this article: Neil M. Malamuth, Tamara Addison & Mary Koss (2000) Pornography and Sexual Aggression: Are There Reliable Effects and Can We Understand Them?, Annual Review of Sex Research, 11:1, 26-91, DOI: [10.1080/10532528.2000.10559784](https://doi.org/10.1080/10532528.2000.10559784)

To link to this article: <https://doi.org/10.1080/10532528.2000.10559784>



Published online: 15 Nov 2012.



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Pornography and Sexual Aggression: Are There Reliable Effects and Can We Understand Them?

Neil M. Malamuth
University of California
Los Angeles

Tamara Addison
McMaster University

Mary Koss
University of Arizona

In response to some recent critiques, we (a) analyze the arguments and data presented in those commentaries, (b) integrate the findings of several meta-analytic summaries of experimental and naturalistic research, and (c) conduct statistical analyses on a large representative sample. All three steps support the existence of reliable associations between frequent pornography use and sexually aggressive behaviors, particularly for violent pornography and/or for men at high risk for sexual aggression. We suggest that the way relatively aggressive men interpret and react to the same pornography may differ from that of nonaggressive men, a perspective that helps integrate the current analyses with studies comparing rapists and nonrapists as well as with cross-cultural research.

Key Words: mass media, pornography, rape, sexual aggression, sexually explicit media.

Anyone reading some of the recent reviews of the literature on the effects of sexually explicit media would have to be perplexed. On the one hand, some researchers have concluded that certain reliable effects have been demonstrated (e.g., Felson, 1996; Linz & Malamuth, 1993; Malamuth, 1989, 1993; Russell, 1988, 1998), whereas others strongly dismiss the existence of any reliable effects (e.g., Brannigan, 1997; Fisher & Grenier, 1994). With this review, we hope to contribute to a better understanding of the relationship, if any, between individual differences in the degree to which men use sexually explicit media and their overt acts of sexual aggression. Our goal is to shed some light on these contradictory conclusions.

We are grateful to Dr. Eugenie Dye for comments on earlier drafts of this paper. Some preliminary analyses of the pornography variable in this database were also incorporated in a chapter by Malamuth (1998b) using an odds-ratio "risk" approach. Although the analyses described here are much more elaborate and detailed, the overall conclusions are clearly consistent with those findings.

Correspondence concerning this article should be addressed to Neil Malamuth, Communication Studies, 334 Kinsey Hall, UCLA, Los Angeles, CA 90095-1538. (nmalamut@ucla.edu)

This article is organized into two separate but interrelated major sections. The first is a critical examination of studies contending that there have not been any reliable connections found between pornography and aggression. Fortunately, there have been several recent meta-analytic studies that summarize the research literature. We, in turn, review the findings of these meta-analyses as part of our rebuttal. However, there is one area of the literature in which relatively little research is available, and consequently there has not been a meta-analysis conducted. This area is concerned with the possible relationship between pornography use and individual differences in sexual aggression in the noncriminal population. Using a large national representative sample, we present a series of statistical analyses to address this issue in the second major section of this chapter. In these analyses, we focus on key issues raised by researchers who criticize limitations in other investigations. We believe that the two sections of this article lead to some common conclusions, which we integrate within a model of the characteristics of men who are relatively likely to commit sexually aggressive acts.

A REVIEW OF PORNOGRAPHY RESEARCH

Overview

The Pornography Industry

Forbes magazine recently described the companies that produce sexually explicit depictions as constituting a 56 billion dollar global pornography industry that is becoming increasingly mainstream. In fact, some internet pornography companies are now listed on the NASDAQ stock exchange (Morais, 1999). Pornographic depictions are much more frequently used by male than by female consumers, and most of the scientific research in this area has dealt with their effects on male consumers (Malamuth, 1996). Despite (or perhaps because of) the pornographic industry's tremendous size and growth, sexually explicit materials continue to engender much political, legal, moral, and scientific debate (Linz & Malamuth, 1993; Russell, 1998; Strossen, 1995).

Defining Pornography

Numerous efforts have been made to define pornography and distinguish it from other terms, such as erotica. A consensus does not exist among laypersons, policy makers, or the legal system. Supreme Court Justice Stuart Potter admitted that although he could not define pornography, even "he knew it when he saw it" (*Jacobellis v. Ohio*, 1964). Through this assertion, he implied that most observers, upon inspection of certain materials, would agree whether or not they were

pornographic. Justice Potter's claim has become famous because it highlights the difficulties involved in explicitly defining pornography. Although some commentators have suggested that such definitional difficulties render the term *pornography* virtually meaningless, we do not believe this conclusion is necessarily warranted. Many linguistic constructs that are regularly used by both laypersons and scientists have proven very difficult to define in explicit, precise ways (e.g., see Silverberg & Gray, 1992). Nevertheless, such terms are frequently used in everyday and scientific discourse, and useful conceptual and operational definitions may be provided.

Linz and Malamuth (1993) noted that the various definitions of pornography that are typically used presuppose beliefs about what it does or does not do. Formulation of these has largely been guided by the Conservative, Radical Feminist, or Liberal perspectives, reflecting their political and, in some cases, religiously based views on pornography. These perspectives differ in the way they frame the importance of this topic (e.g., perceiving pornography as primarily relevant to issues such as moral decay, subjugation of women, free speech, etc.).

Many researchers have sought to distinguish between different types of sexually explicit media. They suggest that more differentiated distinctions should be made through use of specific terminology instead of blanket designations of all sex-related materials under an all-encompassing label, such as "pornography." For example, Senn and Radtke (1990) differentiated between erotica, nonviolent pornography, and violent pornography based on a variety of dimensions and demonstrated that undergraduate female students could quite effectively apply such distinctions to the content of sexually explicit magazines. Although such distinctions have proven very useful in laboratory studies of the effects of various sexually explicit materials (Malamuth, 1989, 1993; Osanka & Johann, 1989), it is much more difficult to effectively operationalize such distinctions in naturalistic settings. For instance, most sexually explicit magazines containing some sexually violent content also include much sexually nonviolent content (e.g., Malamuth & Spinner, 1980), and it is typical for the consumers who view the more "extreme" type of stimuli to also consume the "milder" content (Malamuth & MacIlwraith, 1989). Moreover, individuals who are prone to sexual aggression may form violent sexual fantasies using sexually nonviolent depictions (Marshall, 1988).

For the purposes of the present review, we will use terms such as *sexually explicit media* and *pornography* interchangeably. In using such terms, no pejorative meaning is necessarily intended to refer to media that is aimed at sexually arousing the consumer. In keeping with the

literature, we will use the terms *nonviolent pornography* and *consenting sexual depictions* to refer to sexually explicit images that do not contain coercion. The terms *violent pornography* or *sexually violent media* will be used to refer to materials that do contain coercive material. Sado-masochistic stimuli are a somewhat ambiguous category and have not been extensively studied, although they have sometimes been included in the sexually violent category.

Scientific Research

Definitions of pornography have been closely tied to the types of scientific studies that researchers have chosen to conduct. These studies, as noted previously, have largely been guided by the Conservative, Radical Feminist, and Liberal perspectives (Linz & Malamuth, 1993). Researchers have often addressed separate questions raised by each of these perspectives and have seldom pitted the predictions of one theory against the others. The Conservative perspective condemns the negative influence of pornography on the values of individuals and on social institutions such as the traditional family, and evidence showing changes in attitudes or values in such areas is considered important (e.g., Zillmann & Bryant, 1982). The Liberal perspective generally regards pornography as having negligible negative impact and sometimes even having beneficial effects. This perspective has also emphasized that the First Amendment should protect most forms of communication, with exceptions made only in areas such as direct incitement to immediate lawlessness (*Brandenburg v. Ohio*, 1969). The important research question guiding this perspective is to determine whether evidence of direct harm on criminal behavior (e.g., rape) results from exposure to pornography. The Radical Feminist perspective has emphasized pornography's negative effects on men's attitudes and behavior toward women, and on the power balance between men and women (MacKinnon, 1986, 1993; Russell, 1998). Evidence of changes in attitudes about violence against women or sexism as a function of exposure to pornography is considered important by advocates of this perspective.

In our view (e.g., Linz & Malamuth, 1993) each of these three perspectives has had some findings in support of its position. However, the key question focused on in the present article is whether any reliable findings have been found that are broadly applicable across the wide range of studies conducted in this area. Some writers assert that none have been found. For example, Fisher and Grenier (1994) focused their review and research on violent pornography. They noted that various researchers and government commissions have concluded that reliable effects have been found in this area. In fact, some countries have

changed their laws about what types of sexually explicit media are or are not restricted, partly justifying their distinctions between materials such as violent pornography and other stimuli on the basis of research findings (e.g., in Canada, see *Butler v. Her Majesty the Queen*, 1992). In contrast, Fisher and Grenier (1994) question the reliability of research findings, stating that when they “examined research evidence on effects of violent pornography, . . . a highly inconsistent pattern of empirical findings . . . emerged” (p. 24). To reinforce their conclusions, Fisher and Grenier provided a table of “conflicting research on effects of violent pornography,” (p. 25) which they present, in two separate columns. In one column, they listed studies confirming that “violent pornography is associated with antiwoman thoughts and antiwoman acts” (p. 25). In the other column, they presented an equal number of studies which, according to Fisher and Grenier, “fail to confirm” such an association.

It is important to consider the representative quality and accuracy of the summary presented by Fisher and Grenier (1994) because their review has frequently been cited as ostensive proof that research in this area has not yielded any reliable effects (e.g., Barak & Fisher, 1997; Barak, Fisher, Belfry & Lashambe, 1999). For instance, Barak and Fisher (1997) referred to a growing body of literature as confirmation that the “effects of exposure to sexually explicit materials remain elusive” (p. 354), and that there exists a “highly inconsistent literature concerning effects of sexually explicit stimuli on men’s attitudes and behaviors toward women” (p. 365). Similarly, Brannigan (1997) refers to the article by Fisher and Grenier (1994) as a “landmark” inquiry seriously questioning the value of media effects studies. Other scholars writing reviews of various literatures (e.g., Leitenberg & Henning, 1995) uncritically treat as comparable the original research and that of Fisher and Grenier’s. We, however, question the representativeness of the findings cited by Fisher and Grenier, the accuracy of their descriptions of certain studies, and the validity of their research. We will therefore consider in some detail the Fisher and Grenier summary of the literature and their own related research presented after that summary.

There are several important concerns that can be raised about the approach used by Fisher and Grenier. Although they do not argue that their list of studies in the “supporting” and “opposing” columns is a comprehensive one, they certainly create the impression that theirs is a representative listing of the weight of the evidence. Such a presentation raises at least two interrelated concerns: First, within any study there may be several dependent variables, and the reviewers may have selectively referred to some of the findings and not others. For example, if several studies included the same three dependent variables, it would

not necessarily be the case that in all of these studies there would be clear effects on all of the variables, even if a “real” overall effect exists. Due to sampling error and other factors, one would need to consider the complete findings of each study, as well as the overall set of studies. Although some variability is inevitable even among very comparable studies, this research literature encompasses a broad spectrum of different independent variables, dependent variables, methodologies, research settings, experimenters, characteristics of participants, and sampling techniques. The quality of protocol standards differed from one study to the next, introducing many sources of variability. Reviewers wishing to emphasize the conflicting findings could do so easily by selecting a dependent variable within a particular study for which the effects were not significant, even though when taken as a whole the key hypothesis for that study was supported. This may be particularly problematic in studies including a major dependent variable for which the theoretical rationale has been clearly articulated but also added some other dependent measures of secondary interest, for which the theoretical rationale for expecting an effect is less clear. As indicated later in this review, we believe that Fisher and Grenier’s review has used some research in this way. Secondly, when critiquing a large literature, reviewers may consciously or unconsciously select to emphasize only certain parts of the total literature, which may not be truly representative of the full range of studies available. Again, we believe this occurred in Fisher and Grenier’s summary.

Keeping in mind these two types of concerns, we now turn to an examination of studies that Fisher and Grenier categorized as having failed to confirm the effects of violent pornography. We will then summarize the conclusions of meta-analytic studies that have objectively averaged the results of all available published studies meeting well-defined criteria.

A Critical Examination of Fisher and Grenier’s (1994) Literature Summary

Overview

In our judgment, a careful examination of most of the studies listed by Fisher and Grenier (1994) as failing to confirm effects of violent pornography actually reveals considerable evidence to the contrary. To be fair to Fisher and Grenier, they do not claim that each of the studies they cite necessarily failed to find any negative effect, but they select it to illustrate how a particular dependent variable within the study did not show an ostensibly expected effect. However, we believe that the particular examples they use are not very good illustrations of

the point they try to make. It is, therefore, worthwhile to consider in some detail all of the studies Fisher and Grenier categorized as failing to show effects.

Presented in Table 1 are all of the studies listed by Fisher and Grenier (1994) as "failing to confirm that violent pornography is associated with antiwoman thoughts and antiwoman acts" (p. 25). We present their summary of the findings and then our analyses. As indicated in this table, we believe that Fisher and Grenier did not make a convincing case, even taking these selected studies alone.

Fisher and Grenier's "Replication Attempt"

In addition to their summary of the literature in this area, Fisher and Grenier (1994) presented research that ostensibly tried to replicate the effects reported in research on violent pornography. Their presentation is designed to give the impression that after having objectively described studies both for and against the existence of effects, they proceeded to properly test the reliability of the effects that might help resolve these contradictions. Had this research attempted to delineate the relevant dimensions and/or repeatedly attempted to replicate as fully as possible the actual conditions of the key studies, even if the effects were not successfully replicated, it would indeed have been research of considerable value. Unfortunately, the research of Fisher and Grenier is seriously lacking in many areas. We find its methodological shortcomings to be at least as serious as the weakest studies in this literature. In our opinion, a fair attempt has not been made by Fisher and Grenier to replicate the key literature findings of the strongest studies. In fact, Fisher and Grenier ignored studies, such as the field experiment by Malamuth and Check (1981), replicated by Weisz and Earls (1995). Yet we consider (and in previous writings have emphasized) such a study to be the strongest single available demonstration of the "negative" effects of exposure to violent-sexual messages. It controlled for limitations related to "demand characteristics" and "ecological artificiality," issues highlighted by Fisher and Grenier. Instead, Fisher and Grenier focused on the part of the literature that consisted of laboratory research in which a relatively brief exposure to violent pornography was followed by an assessment of the immediate effects. We will, therefore, consider the comparability of the Fisher and Grenier research to such studies.

The research reported by Fisher and Grenier (1994) consisted of two studies. The first focused on the effects of exposure to violent pornography on men's fantasies and attitudes about women. The research of Fisher and Grenier combined in a single study several of the dependent

Table 1
Critical Analysis of Studies Listed by Fisher & Grenier (1994) as Failing to Confirm That Violent Pornography is Associated With Antiuoman Thoughts and Acts

Study	Fisher & Grenier's Summary	Our Discussion of the Findings
Linz, Donnerstein, & Penrod (1988)	"Exposure to sexually violent films had <i>no effect</i> on men's rape myth acceptance" (p. 25).	<p>The primary focus of this research was on the effects of exposure to "slasher films" depicting much suffering to the victim on the audience's emotional desensitization and not on attitudes such as rape myth acceptance. There was no condition that included the type of depiction most often shown in experimental research to affect attitudes of this type, such as depictions showing that women derive pleasure from being aggressed against (e.g., Malamuth & Check, 1981). There were several types of dependent measures included. Although Fisher and Grenier are correct in noting that there were no significant effects on rape myth acceptance (which, as noted, would appear unlikely with this type of exposure), significant predicted effects were found on measures assessing emotional and sympathetic reactions to rape victims. The findings did show that "subjects exposed to R-rated film violence against women showed a tendency to be less sympathetic to the victim of rape portrayed in the trial. . . . More robust was the finding that the R-rated violent-film subjects were less able empathize with rape victims in general when compared with no-exposure control subjects and subjects exposed to other types of films. Level of film exposure, however, affected specific sympathy and general empathy differently: Longer film exposure was necessary to affect the general empathic response. In this regard, the findings are similar to other investigations that have found less sensitivity for rape victims following exposure to violent pornography" (p. 766).</p>
Malamuth & Ceniti (1986)	"Exposure to sexually violent films had no effects on men's self-reported likelihood to rape. . . . Exposure to sexually violent films and sexually violent written stimuli, compared to equivalent	<p>There are two important considerations here that Fisher and Grenier fail to note. First, seldom have previous researchers found that exposure to any type of pornography affected the self-reported, "likelihood of raping" dependent measure. This measure appears to</p>

Table 1 (continued)
Critical Analysis of Studies Listed by Fisher & Grenier (1994) as Failing to Confirm That Violent Pornography is Associated With Antiwoman Thoughts and Acts

Study	Fisher & Grenier's Summary	Our Discussion of the Findings
	<p>exposure to sexually nonviolent materials, had no effect on aggression by men against a female confederate" (p. 25).</p>	<p>reflect a relatively stable attraction to sexual aggression (Malamuth, 1989a, 1989b) that is not changed by short-term exposures, as implemented in experimental studies. (As noted later in this article, however, such reported likelihood has been consistently found to correlate with long-term pornography use in naturalistic settings.) We are aware of only a couple of experimental studies reporting any effects of pornography exposure with this type of dependent measure, and these were quite limited. Check and Guloien (1989) found the effect only for high psychotacticism participants and not for others, a moderating variable not assessed by Malamuth and Ceniti. The only other experiment that we could find reporting such an effect was never published, but was briefly described within a chapter by Donnerstein (1984). It differed considerably from Malamuth and Ceniti's study in several respects, including the lack of a neutral or no-exposure control group comparison. Second, Malamuth and Ceniti assessed only long-term effects (several days to 2 weeks after exposure). Such effects were not assessed in the other studies in the literature. Therefore, the fact that in the Malamuth and Ceniti study long-term effects were not found on reported likelihood of raping or on laboratory aggression is <i>not</i> inconsistent with the experimental literature as a whole, where the findings have shown short-term effects on laboratory aggression. These have typically been explained by short-term activation or priming of aggressive tendencies (Malamuth, 1989; Malamuth & Ceniti, 1986). Taken as a whole then, the Malamuth and Ceniti study does reveal the boundaries of the effects reported in the literature but does not reflect inconsistencies in the findings (as suggested by Fisher and Grenier).</p>

Table 1 (continued)
Critical Analysis of Studies Listed by Fisher & Grenier (1994) as Failing to Confirm That Violent Pornography is Associated With Antiwoman Thoughts and Acts

Study	Fisher & Grenier's Summary	Our Discussion of the Findings
Malamuth, Haber, & Feshbach (1980)	"Exposure to sexually violent materials decreased men's acceptance of violence against women" (p. 25).	Malamuth et al. assessed the impact of exposure to a sadomasochistic portrayal on reactions to a rape story. There was no direct measure of men's acceptance of violence against women, but one of the measures assessed punitiveness toward the rapist. It was found that males who had read the sadomasochistic version of the first story were more severe in their punitiveness toward the rapist than those who had read the nonviolent version. In addition, there were actually effects that may be considered negative effects of exposure to the sadomasochistic portrayals, but these were moderated by individuals' levels of aggression-anxiety. Men who were relatively low in anxiety about aggression and were exposed to the sadomasochistic version of the story tended to perceive that the rape victim experienced less pain and trauma and resisted the rapist less. High aggression-anxious males, on the other hand, tended to become more conscious of the plight of the rape victim and the pain she experienced. Finally, for males exposed to the sadomasochistic portrayal of pain infliction as a source of pleasure, greater perception of pain was associated with greater sexual arousal, in contrast to the reverse for males who were not exposed to such a sadomasochistic portrayal. Taken together, the findings of this study are not very accurately described by Fisher & Grenier.
Demare, Briere, & Lips (1988)	Self-reported use of sexually violent materials uncorrelated with rape myth acceptance, endorsement of interpersonal violence against women, adversarial sexual beliefs, or attitudes toward women.	This is indeed what was found in this study on these attitudes (and as shown in the meta-analyses discussed later it is the only segment of the research where reliable effects have been found). Fisher & Grenier then listed three studies which they claimed show that "sex offenders were no more likely than controls to use sexually violent materials" (p. 25). The three studies are those by Langevin et al. (1988), Marshall (1988), and Goldstein (1973). We believe that only

Table 1 (continued)
Critical Analysis of Studies Listed by Fisher & Grenier (1994) as Failing to Confirm That Violent Pornography is Associated With Antiwoman Thoughts and Acts

Study	Fisher & Grenier's Summary	Our Discussion of the Findings
Goldstein (1973)	"Sex offenders were no more likely than controls to use sexually violent materials" (p. 25).	<p>the findings of the first of these are described accurately by Fisher & Greiner and, therefore, will discuss the other two studies next.</p> <p>A more detailed description of the findings of Goldstein (1973) is presented in a book by Goldstein, Kant, & Hartmann (1973). It is reported there that although rapists reported less exposure to pornography in adolescence than the control comparison groups, there are various aspects of the data suggesting that the type of pornography rapists were exposed to and the degree to which they were affected by it may have differed. For example, rapists reported an earlier age of "peak experience" with pornography. In addition, they were far more likely to have encountered pornographic photos displaying explicit sexual acts (rather than nudes) at an early age and to have had a greater desire to imitate the activity portrayed in pornography (although they said they were less likely to have actually done it). Rapists were more likely to relate daily masturbation to thoughts of pornography, to have developed a stronger interest in pornography early in life, to have become repeatedly aroused by a particular theme, and to have more feelings of frustration and guilt related to their pornography exposure than control participants.</p> <p>Although Goldstein et al. (1973) did not specifically inquire about pornography involving coercive sex themes, contrary to the conclusions suggested by Fisher & Grenier, it is clear from Goldstein et al. (1973) interviews that media depictions involving sexual violence (e.g., motorcycle films depicting "gang bangs") relatively frequently became part of rapists' daydreams and fantasies. In addition, the researchers reported that 55% of the rapists (as compared to 9% of</p>

Table 1 (continued)
Critical Analysis of Studies Listed by Fisher & Grenier (1994) as Failing to Confirm That Violent Pornography is Associated With Antivictim Thoughts and Acts

Study	Fisher & Grenier's Summary	Our Discussion of the Findings
Marshall (1988)	<p>"Sex offenders were no more likely than controls to use sexually violent materials" (p. 25).</p>	<p>the controls) used scenes from pornography in their fantasies and daydreams.</p> <p>Marshall compared rapists, child incest molesters, nonincest child molesters and nonoffenders in their use of "hard-core" sexually explicit materials. He found that when comparing the "use of any type of 'hard-core' sexual stimuli," most groups of sexual offenders generally did use pornography more than nonoffenders. For example, in terms of current use, 67% of heterosexual child molesters and 83% of rapists, as compared to 29% of nonoffenders, reported currently using pornography. As well, offenders often reported using pornography "as an instigator" to their crimes (35% of rapists).</p> <p>Marshall collapsed his presentation of the results across different types of hard-core pornography and did not report the details of an actual separation by type of pornography. The only reference in his article to what may be labeled violent pornography is as follows: "Child molesters do not have remarkably higher access to 'kiddy porn' than do other subjects nor do rapists show particularly greater use of forced sex materials than do other subjects" (p. 278). Therefore, Marshall indicated that rapists used pornography of various types more than nonoffenders but that there was not a "particularly greater" use of violent pornography (although it certainly appears that they also used this type of pornography more than nonoffenders). Marshall further noted that a substantial number of rapists used consenting sex depictions to "incite rape images in the process of preparing himself to attack a woman" (p. 280). In considering the implications of his findings on the various types of sexually explicit media, Marshall concluded that</p>

Table 1 (continued)
Critical Analysis of Studies Listed by Fisher & Grenier (1994) as Failing to Confirm That Violent Pornography is Associated With Antiwoman Thoughts and Acts

Study	Fisher & Grenier's Summary	Our Discussion of the Findings
		<p>Any treatment program for these men must include consideration, not just of the rate and intensity of deviant thoughts, but also of the possible functional relationship between exposure to sexually explicit materials and these deviant thoughts. Similarly, treatment programs should attend to the possible link between exposure to such stimuli and the actual offensive acts of these men. Furthermore, one must also consider the way in which sexually explicit depictions may encourage, or at least support, negative attitudes toward women and children, particularly in sexual matters. (p. 285)</p> <p>It is surprising, therefore, that Fisher and Grenier would present this study as providing data that violent pornography is not associated with sexually aggressive characteristics. The only conclusion that appears justified from these data is that violent pornography was not found to be more highly associated with offender status, but that both types of pornography were more often used by rapists.</p>

measures that have been studied separately in several different studies, and Fisher and Grenier also added other peripherally relevant measures.

Part of the study by Fisher and Grenier (1994) was focused on fantasies. It was supposedly an attempt to replicate the findings of Malamuth (1981). There is much literature showing that sexually coercive fantasies are not rare among both males and females (e.g., Greendlinger & Byrne, 1987). In order to assess the potential impact of exposure to violent pornography on the occurrence of such fantasies, it is necessary to create an environment in which participants feel comfortable in having and in reporting such fantasies. Because none of the participants in the study by Fisher and Grenier created such fantasies, it appears that these investigators failed to create such an environment. Fisher and Grenier would have provided far more convincing evidence of the lack of pornography's impact had they created an environment in which subjects did report some "typical" levels of sexually coercive fantasies in any of the exposure conditions, as was indeed the case in the original Malamuth (1981) study.

Let us turn to other aspects of this first Fisher and Grenier (1994) study. Subjects were randomly assigned to be exposed to one of several edited versions of a 9-minute film. The original version was used by Donnerstein and associates (e.g., Donnerstein, Donnerstein, & Evans, 1975) to measure short-term effects on laboratory aggression. We are not aware of any study in which this particular stimulus has been used to study effects on fantasies, beliefs, or attitudes. In previous studies showing effects from brief exposures, they have been shown only on very specific measures directly corresponding in their messages to the stimuli presented and generally only for individuals who are particularly predisposed to hold certain "rape myths" (e.g., Malamuth & Check, 1985). In addition, assessment was shortly after exposure, when "priming" effects were more likely to be detected. None of these conditions were met in the study by Fisher and Grenier because the link between the content of the exposure and dependent assessment was quite remote in content and time, and individual differences were not studied. After the brief exposure, participants were first asked to write down their sexual fantasies, and next they were given the projective Thematic Apperception Test. Then, they were administered a general measure of Attitudes Toward Women Scale (a measure that has never been shown to be influenced by exposure to violent or any other type of pornography). Then the Women as Managers Scale (Peters, Terborg, & Taynor, 1974), another measure that has never been reported to be influenced by pornography exposure, was administered, followed only then by two attitudinal measures used in some earlier research (the Acceptance of Interpersonal Violence scale

and the Rape-Myth Acceptance scale [Burt, 1980]).

Had Fisher and Grenier (1994) reported effects on the multifaceted scales measuring general attitudes about women (i.e., the Attitudes Toward Women and the Women as Managers Scale), it would have severely strained credibility. Such an effect would be rare indeed in media research generally and in the "violent pornography" literature specifically.

The second study reported by Fisher and Grenier (1994) also unfortunately appears of little scientific validity. Initially, there were 22 undergraduate male students in this study, but 8 "indicated considerable suspicion and awareness concerning the laboratory aggression paradigm, and these suspicious subjects were dropped from the data analysis" (p. 32). This means that more than one third of the participants were eliminated due to suspicion, a mortality rate invalidating the entire study.

There was only one condition reported in this study in which participants were exposed to violent pornography without any control group. Because there was only a single condition, we do not know whether violent pornography increased, inhibited, or had no effect on aggression. The dependent measure consisted of a procedure in which subjects could select any of three options: Proceed to the debriefing phase without giving any feedback to the confederate, give feedback over an intercom, or deliver an electric shock. Nine subjects chose to proceed immediately to the debriefing phase, three chose to speak to the confederate over the intercom, and two delivered the shock. But Fisher and Grenier (1994) emphasized that these two participants had earlier expressed interest in using the electronic apparatus, and therefore even their responses may be considered to be nonaggressive. Because the aggression levels for all subjects were, therefore, very low or nonexistent, Fisher and Grenier contended that in this more realistic set of conditions they showed that exposure to violent pornography does not increase aggression.

We believe that their own data clearly reveal that they failed to create conditions whereby the potential influences on aggression could be meaningfully studied. Clearly, in naturalistic settings, male aggression against women is unfortunately a frequent and serious problem. In order to properly test whether violent pornography increases the likelihood that some men might be aggressive, laboratory researchers must create, within ethical limitations, the maximum conditions to detect the effect. A laboratory analogue with some potential for generalization must at least demonstrate that the behavior being studied occurs in some conditions at a frequency level that enables analysis of the factors that increase or decrease

it. No one would deny that there are many conditions under which exposure to violent pornography is not followed by aggression. In fact, in the early research on violent pornography and aggression, it was demonstrated that creating a relatively inhibited social environment for the occurrence of aggression may totally nullify the priming influence of violent pornography. Creating a disinhibited environment, in contrast, may enable effects to be observed (Malamuth, 1978). By Fisher and Grenier's own admission, they created a set of conditions that did not produce aggression. Although they claimed that giving subjects an alternative as to whether to aggress or not created ecological validity, we believe that they failed to create conditions under which the effects of different exposures on aggression could be properly assessed.

Meta-Analyses

Differences Among Studies

Varied methodologies and dependent measures have been used to study the effects of pornography. Most of the studies conducted within North America, particularly the United States, may be described along two orthogonal dimensions based on whether (a) they used experimental (random assignment to conditions) or correlational methodology and (b) the dependent variable they assessed was a response presumably affecting sexual aggression (e.g., attitudes supporting such aggression) or some measure of actual aggression. Such studies may therefore be organized into a 2 x 2 table, but with one of the cells in this table having two subtypes of studies (see Table 2).

Table 2
An Organizational Framework for the Differing Pornography Studies and Corresponding Meta-Analytic Summaries

	Method Experiments	Correlational Studies
Attitudes	Experiments on attitudes (meta-analysis by Allen, Emmers, et al., 1995)	Naturalistic studies of correlations between pornography and attitudes (meta-analysis by Allen, Emmers, et al., 1995)
Aggressive Behavior	Experiments on lab aggression (meta-analysis by Allen, D'Allessio, & Brezgel, 1995)	(a) Comparing criminals vs. noncriminals on pornography use (meta-analysis by Allen et al., 2000) (b) Within noncriminals, (meta-analysis not available)

As indicated in this table, one type of research involved experiments (usually, but not exclusively in laboratory settings). In these experiments whether participants were exposed to some type of pornography was manipulated. Whether there were resulting differences between the experimental and control groups in responses such as attitudes accepting of aggression against women was then examined.

The second type of research is detailed in the upper right corner of Table 2. In this research whether differences among men in such attitudes are correlated with self-reported aggression in naturalistic settings was assessed.

In the third type of research (see bottom left corner of this table), participants were exposed to some type of pornography, and the type of aggressive behavior that can be elicited in a laboratory setting (e.g., delivery of noxious stimuli to another person) was measured. The fourth category (see bottom right corner of table) consists of correlational studies focusing on the potential relationship between pornography consumption and actual sexual aggression in naturalistic settings. Here there are two subtypes of research studies. The first is focused on differences in pornography use between individuals convicted of crimes, such as rape (i.e., criminals or offenders) versus men from the general population (i.e., noncriminals or nonoffenders). The second is focused only on noncriminals, but the potential association between pornography use and individual differences in reported sexual aggression (which did not result in criminal conviction) is explored. Because a majority of acts of sexual aggression, including rape, are never successfully prosecuted (see the discussion of this issue later in this review) unprosecuted acts of aggression are an important comparison.

In addition to these types of studies, there have been a number of time series studies in other cultures (e.g., Diamond & Uchiyama, 1999; Kutchinsky, 1991) and some state level comparisons within the United States (Baron & Straus, 1987). Later, we will discuss the relevance of these cross-cultural findings to the research conducted within North America (which will be the primary focus here).

What Is Meta-Analysis?

Meta-analysis provides a systematic method for the synthesis of a research literature by using explicit standards for judgments and conclusions. It consists of statistical techniques that provide a quantitative summary of all of the available data from the existing literature that meet specified criteria. Because a meta-analysis has very explicit rules, other scholars can easily replicate it.

Importantly, there are aspects of the analysis that indicate whether the literature is homogeneous (which would indicate potential inconsistency in the findings) and follow-up moderator analyses that may help identify the basis for differences among studies. Meta-analysis has been judged a superior method of literature review compared to other traditional forms of review by various commentators (see Allen, D'Alessio, & Brezgel, 1995, for a more detailed discussion).

Meta-Analyses of Pornography Research

Several meta-analytic studies have been published that integrate findings in the pornography literature (Allen, D'Alessio, & Brezgel, 1995; Allen, D'Alessio, & Emmers-Sommer, 2000; Allen, Emmers, Gebhardt, & Giery, 1995; Hearold, 1986; Oddone-Paolucci, Genuis, & Violato, 2000; Paik & Comstock, 1994). We believe that those conducted by Allen and associates (Allen, D'Alessio, & Brezgel, 1995; Allen, D'Alessio, & Emmers-Sommer, 2000; Allen, Emmers, Gebhardt, & Giery, 1995) are particularly useful because they meet rigorous standards. For example, they used the study's sample size when weighing the average effect. Also, when encountering possible heterogeneous average correlations, they tested for moderators. The other meta-analyses did not use all these important procedures. We will, therefore, focus on the findings of the three meta-analyses by Allen and associates, whose findings are generally consistent with the other three meta-analyses (which actually report even stronger effects).

Fortunately, the meta-analyses conducted by Allen and his associates correspond well to virtually every category presented in Table 2. The only exception is the subtype of research comparing the possible correlation between pornography use and sexual aggression within the noncriminal population. Therefore, after presenting a summary and discussion of the meta-analyses conducted by Allen and his associates, we will turn our attention to this one area where a meta-analysis is not currently available. Except as otherwise noted, these meta-analyses generally revealed homogeneous effects, thus contradicting Fisher and Grenier's (1994) contention regarding the lack of consistency in the findings.

Following is a summary of the findings of the various meta-analyses published by Allen and associates in the past 5 years.

Effects of Pornography on Attitudes Supporting Sexual Aggression

Allen, Emmers, et al.'s (1995) meta-analysis on the relationship between pornography exposure and attitudes supporting sexual aggression (referred to in their paper as *rape myth acceptance*) includes both experiments and correlational studies. In this section we focus on the former and discuss the latter type of studies subsequently.

Most of these experiments (which included random assignment to conditions, enabling cause and effect conclusions) were conducted in laboratory settings, but some of the research was in field settings (e.g., Malamuth & Check, 1981). There were a total of 16 experiments with 2,248 participants. The overall average effect combining all of the studies, which included depictions of consenting sexual activity (i.e., nonviolent pornography) and violent pornography showed a significant increase ($r = .15$) in attitudes supporting sexual aggression following pornography exposure, and this effect held when nonviolent and violent pornography were examined separately (see Table 3). Although the effect size appears slightly higher for nonviolent pornography than for violent pornography, in eight studies both types of the materials were actually included, therefore enabling a more direct comparison. Here it was found that violent pornography resulted in significantly greater increase in attitudes supporting aggression than did nonviolent pornography.

Effects of Pornography on Laboratory Aggression

In another meta-analysis, Allen, D'Alessio, et al. (1995) empirically summarized the findings of studies on the effects of exposure to different types of pornography on laboratory aggression. In these studies (i.e., experimental studies), random assignment to conditions was used. Thus it is feasible to reach cause and effect conclusions with confidence. Considerable research supports the validity of such laboratory measures as indicators of aggressivity (Bushman & Anderson, 1998).

Allen, D'Alessio, et al.'s (1995) meta-analysis included a total of 33 studies with 2,040 participants. As indicated in Table 3, although the overall effect ($r = .13$) shows that exposure to pornography does cause an increase in behavioral aggression, follow-up moderator analyses revealed different effects as a function of the type of stimuli used. Exposure to nudity alone (9 studies) was found to *reduce* aggression, whereas exposure to either nonviolent (24 studies) or violent depictions (7 studies) of sexual activity *increased* aggression.

In sum, experimental research shows that exposure to nonviolent or violent pornography results in increases in both attitudes supporting sexual aggression and in actual aggression. Consideration of nudity alone was included only in the aggressive behavior studies, and these showed reduced aggression following such exposure.

Pornography and Attitudes Favoring Sexual Aggression (in naturalistic settings)

Although correlational studies do not enable cause and effect conclusions, they often have the advantage of assessing responses occurring in

Table 3
Meta-Analytic Studies of Pornography Research

Meta-Analytic Study	Method	Participants	Stimulus	Dependent Measure	Effect Size	N	Conclusion
Allen, Emmers, et al. (1995)	Correlational and Experimental combined Correlational only Experimental only	Students		Attitudes for Sex Aggression	.10*	4,268	More pornography use, more support aggression
			All Pornography use combined		.06	2,020	No reliable effect
			Pornography use combined vs. control		.15*	2,248	More pornography use, more support aggression
			Nonviolent Pornography only vs. control		.13*	1,048	Nonviolent pornography increases support for aggression
			Violent Pornography only vs. control		.11*	719	Violent pornography increases support for aggression more than control
			Studies with both nonviolent pornography and violent pornography		.16*	762	Violent pornography increases support more than nonviolent pornography, though both significant
Allen, D'Alessio, & Brezgel (1995)	Experimental	Students	All pornography combined vs. control	Laboratory aggression	.13*	2,040	Pornography increases aggression
			Nudity vs. control		-.14*	403	Nudity reduces aggression
			Nonviolent pornography vs. control		.17*	1,229	Nonviolent pornography increases aggression

Table 3 (continued)
Meta-Analytic Studies of Pornography Research

Meta-Analytic Study	Method	Participants	Stimulus	Dependent Measure	Effect Size	N	Conclusion
			Violent pornography vs. control		.22*	353	Violent pornography increases aggression
Allen et al. (2000)	Correlational	Offenders vs. nonoffenders	Pornography use	Overall measure Frequency of use Age of first exposure Sexual "acting out" after pornography use	.06 -.05 .03 .23*	2,543 1,212 903 1,261	No difference No difference No difference Offenders more likely to "act-out" after pornography use (masturbation, consensual sex, or forced sex)
			All pornography	Physiological sexual arousal	.15*	2,099	Offenders more aroused by all pornography combined
			Consenting pornography	Physiological sexual arousal	-.26*	625	Offenders less aroused by consenting sex
			Violent pornography	Physiological sexual arousal	.39*	207	Offenders more aroused by violent pornography

N = number of participants in total of studies combined.

*Indicates statistical significance of average effect across studies.

naturalistic settings. Allen, Emmers, et al.'s (1995) meta-analysis included eight studies that examined such correlations between the amount of pornography use and various types of attitudes supporting sexual aggression. There were a total of 2,020 participants, mostly college students, in these studies (see Table 3). The meta-analysis yielded a modest average positive correlation ($r = .06$) which the researchers concluded does *not* show a significant, reliable relationship (see Table 3). In this analysis, there was also some ambiguity regarding whether a moderator relationship existed (see Footnote 4 of Allen, Emmers, et al.), but the researchers concluded that "this sample probably does not contain a moderating variable" (p. 18).

Pornography and Aggression (in naturalistic settings)

As noted earlier, there are two types of relevant research studies that are concerned with the association between pornography use and aggression in naturalistic settings. In one, criminals are compared to noncriminals. In the other, associations within the noncriminal population are examined.

Criminals versus noncriminals. Allen et al. (2000) conducted a meta-analysis focusing on the pornography use of convicted sex offenders, as compared to those of men from the noncriminal general population. As indicated in Table 3, they examined several types of dependent measures: (a) frequency of pornography use, (b) age of first exposure, (c) the degree to which pornography was a direct prelude to some sexual act (masturbation, consensual sex, or forced sex), (d) and degree of sexual arousal, measured by direct genital measures of such arousal.

The findings across all of the 13 studies and measures combined showed a slight difference, with criminality associated with pornography ($r = .06$). Hence this finding was not judged to be a reliable effect. Similarly, an analysis focusing only on the frequency of use (7 studies, $N = 1,212$, $r = -.05$), although showing that offenders appeared to have slightly less exposure to pornography, was not judged to be reliable. Further, in the five studies included, although criminals tended to be exposed to pornography at a slightly earlier age, this effect wasn't considered reliable ($r = .03$, $N = 903$).

Interestingly, a relatively strong effect was found when considering the average effect across the seven studies in which sexual activity after viewing pornography was examined ($r = .23$). After viewing pornography, criminals were more likely than noncriminals to perform a sexual act, such as masturbation, consensual, or criminal sex.

Finally, after analyzing the degree of physiological sexual arousal, across 32 studies, Allen, Emmers, et al. (1995) concluded that in general

sexual criminals were more aroused than noncriminals ($r = .15$, $N = 2,099$). However, in studies in which portrayals of consenting and non-consenting sex were separated, it was found that in comparison to non-criminals, sex criminals were more aroused by violent sex ($r = .39$). By contrast, the difference was in the opposite direction with consenting sexual portrayals ($r = -.26$).

It should be noted that although criminals may be less aroused sexually by consenting depictions than noncriminals, the data on "sexual acting out" suggest that they may still be more likely than noncriminals to engage in some sexual activity following either type of pornography exposure. This conclusion appears warranted because no moderator effect on the dependent measure of pornography use as a prelude to sexual activity was found. Yet it cannot be ascertained from the description Allen and his associates give of these studies if any opportunity actually existed in the literature available to them for systematic examination of possible moderator effects.

Correlational studies with noncriminals. There have also been a few studies in which the potential relationship, in naturalistic settings, between use of pornography and self-reported sexual aggression was examined. (See the discussion of validity of such reports later in this review.) Before turning to describe two such studies, we would like to briefly mention one relevant study that does not enable differentiation between criminals and noncriminals and was not included in any of the meta-analyses described earlier. In a doctoral dissertation Frank (1990) obtained reports from a sample of 303 college students and 286 prison males of a similar age about their sexually aggressive behavior. Analyses were conducted on the total sample of 589 participants to examine associations between pornography use and sexual aggression. Sexual aggression was measured by a 29-item self-report index. Pornography use was measured by asking participants how frequently they had bought or read any of several pornographic magazines in the past year and by asking them to indicate how often they used or looked at similar magazines when they were growing up.

Analyses are presented as part of odds-ratio analyses (a measure of relative risk), rather than correlations. Results showed what was labeled a significant but modest association between sexual aggression and pornography use. This result was primarily due to those indicating "heavy current use of pornography." Such use had an odds ratio of 2.79, which means that these subjects were nearly three times more likely than the sample as a whole to be sexually aggressive. This investigator also investigated 50 "risk factors" that have been found to correlate with sexual aggression. The investigator rank-ordered them in terms of their

magnitude of association with sexual aggression. He found that current use of sexually explicit magazines ranked very close to the middle of all risk factors (26th).

We were only able to find two studies (Boeringer, 1994; Crossman, 1995) in which the association between noncriminals' pornography use and sexual aggression in naturalistic settings was investigated. In both studies a significant association between sexual aggression levels and use of at least certain forms of pornography was found. Because we find Boeringer's study particularly helpful in our efforts to review the literature, we will discuss it in some detail and only briefly first summarize the findings of the other study.

In a sample of 488 college men, Crossman (1995) investigated the possible association between various degrees of sexual aggression and individual differences variables (i.e., impulsivity, hostility, psychopathology, peer pressure, and pornography use). Sexual aggression was measured by the Koss and Oros (1982) well-validated scale of self-reported sexual aggression. Pornography use was measured by a 17-item scale measuring use of different types of pornography. She found that pornography use was the strongest correlate of sexual aggression among all of the variables studied. Pornography use alone accounted for 12% of the total variance in sexual aggression. She reports that the more frequently men used pornography and the more violent the pornography they used, the more likely they were to be involved in various types of coercive sex, including physical coercion (i.e., rape). Pornography use as a predictor remained significant after controlling for the impact of the other variables.

Boeringer (1994) administered questionnaires to 477 undergraduate males. He assessed four measures of exposure to different types of sexual materials: (a) exposure to soft-core pornography—a scale variable of two questions measuring the degree of respondent's exposure to magazines such as *Playboy*, *Penthouse* and *Hustler*; (b) exposure to hard-core pornography—assessing the degree of respondent's exposure to hard-core pornographic depictions, in which graphic sex acts are shown or described, and exposure to similar videos/movies/magazines, and/or paperback books; (c) violent pornography—consisting only of sadomasochistic portrayals of bondage, whipping, and spanking but (without an explicit lack of consent) in video, magazines, or paperback formats; (d) rape pornography—sexually explicit rape depictions in which force is used (with explicit lack of consent) in video, magazine, or paperback. Because this will be relevant to the discussion that follows, it should be noted that all intercorrelations among these usage measures were at or well above .40 ($p < .001$), except for soft-core porn and rape porn, which correlated .26 ($p < .001$).

The measures of sexual aggression included reports of different types

of coercive sexuality, including those meeting the legal definition of rape, or attempted rape, verbal coercion, and the use of drugs or alcohol as a coercive tactic. Boeringer found that all of the pornography measures correlated significantly and quite strongly with the use of verbal coercion (ranging from between .28 to .34) and the use of drugs/alcohol (ranging from .17 for soft-core pornography to .31 for violent pornography). All the measures of pornography use, except for soft-core porn, also correlated significantly with rape (ranging from .27 for hard-core pornography to .39 for violent and for rape pornography). Boeringer (1994) also conducted a series of additional analyses, which showed, for example, that the "group reporting higher exposure to violent pornography was almost six times more likely to report rape behavior than the low-exposure group (13.8% vs. 2.4%)" (p. 297).

The results of a regression analysis conducted by this investigator, highlighted in both the abstract and the discussion, should also be carefully considered. On the one hand, it may appear to help sort out the relationship between different types of pornography use and aggressive behavior and may appear consistent with the laboratory data showing opposite effects for nudity portrayals versus other types of pornography. On the other hand, some readers may find the complexity of the relationships between different types of pornography and different dependent measures, even within the same study, to support Fisher and Grenier's (1994) assertion that findings are not consistent.

It is worthwhile to begin by focusing on Boeringer's (1994) description of the results in his abstract:

Multivariate analysis indicated that the strongest correlates of sexual coercion and aggression, as well as rape proclivity were exposure to hard-core violent and rape pornography. Exposure to soft-core pornography was positively associated with likelihood of sexual force and nonviolent coercive behavior, but negatively associated with likelihood of rape and actual rape behavior. (p. 289)

Let us consider the basis for this summary statement by focusing on the regression analysis conducted by this investigator. The various types of exposure (soft-core, pornography, violent porn, and rape porn) were also regressed on each of the dependent variables. Here it was found that on verbal coercion, exposure to men's magazines and violent pornography were significant predictors, explaining 13% of the variance. On the variable measuring use of drugs or alcohol to obtain unwanted sex, only exposure to rape pornography was predictive (8%). On the variable of rape, Boeringer reported that exposure to men's magazines was actually negatively related, whereas violent pornography and rape pornography were positively related. In summarizing these

data in the text of the study, the investigator reported that “exposure to milder materials found in soft-core pornography is positively related to engaging in coercive verbal behavior and hypothetical likelihood of using sexual force, but negatively related to actual use of physical force in sex and likelihood of rape” (p. 299).

We believe that there may be an unintended misleading impression created in the latter part of the conclusion presented. In simple correlations, soft-core pornography use was not significantly related to the use of physical force (rape) ($r = .01$) and was positively related to self-reported likelihood of raping. (Data regarding this variable in other studies are described later in this review.) Only in the regression analyses did the direction of the relationships reverse and become significant. As already noted, the predictor variables of different types of pornography use were highly intercorrelated. We believe that the results of the regression analyses may be the result of a “suppressor effect.” Cohen and Cohen (1983) described and provided examples of several varieties of suppression relationship and how to identify the existence of one. The pattern in this study by Boeringer (1994) for the rape likelihood and the rape behavior measures fits such criteria very well (i.e., a significant beta in the regression analysis that differs in magnitude or direction from the initial correlation). Essentially, a suppressor relationship occurs when a predictor variable adds to the prediction of the dependent variable in a regression analyses by virtue of its correlation with the other independent variables. It is called a suppressor variable because there is some overlap between it and the other predictor variable, but it “suppresses” variance of the other predictor that is irrelevant to prediction of the dependent variable.

It can be concluded with confidence, therefore, that the use of violent and rape pornography was positively correlated with various types of sexually coercive behavior. It would be inappropriate to conclude, though, that exposure to soft-core pornography was negatively associated with either likelihood of rape or actual rape behavior. One can only determine from the study that when placed in a “combination set” within the regression equation, soft-core pornography shows a negative association. A complete interpretation of the basis for these effects would benefit from further statistical probing. Regrettably this was not pursued in Boeringer’s study.

Pornography Use and Attraction to Sexual Aggression

Although not the primary focus here, it may be added that in several studies, there have been analyses of associations between pornography use and self-reported likelihood of committing sexually aggressive acts (if one were assured of not being punished), such as forcing a woman to

engage in sexual acts, forced rape, or sexual harassment. This type of measure was originally developed by Malamuth (1981) and later expanded by Malamuth (1989a, 1989b). Malamuth has consistently emphasized that this is a measure of attraction to sexual aggression and not a substitute for measuring actual aggression. In their review, Fisher and Grenier (1994) do not make this distinction sufficiently clear. It is worthwhile, though, to briefly summarize the findings from studies in which pornography use in naturalistic settings has been looked at in relation to these attraction measures.

Boeringer (1994) found the reported likelihood of forcing a woman sexually (LF) correlated significantly with the use of hard-core pornography ($r = .27$), violent pornography (.40) and rape pornography (.39), but it was not correlated with the use of soft-core pornography ($r = .07$). Reported likelihood of raping (LR) was significantly correlated with all types of pornography use (ranging for .22 with soft-core to .40 for violent porn). Demare, Briere, and Lips (1988) found that although exposure to nonviolent pornography and violent pornography correlated with reported likelihood of sexual aggression (measured by LF and LR), discriminant function analysis showed that this relationship was primarily due to the use of sexually violent pornography (note: their presentation does not provide simple correlation statistics). Barak et al. (1999) recently found that pornography exposure, which was measured by exposure to various types of sexually explicit materials in differing media, was significantly correlated with a measure of reported Likelihood of Sexually Harassing ($r = .42$). Crossman (1994) reported that LR was significantly correlated with a relatively comprehensive assessment of the use of various types of pornography ($r = .28$). Check and Guloin (1989) reported that "there were significant differences between high-frequency pornography consumers and low-frequency consumers on . . . reported likelihood of rape ($p < .0005$), reported likelihood of forcing a woman into unwanted sex acts ($p < .020$)" (p. 175). There appears, therefore, to be considerable consistency in studies showing a significant association between habitual pornography use in naturalistic settings and attraction to sexually aggressive/harassing behaviors.

Summary and Discussion of Overall Findings

The following is a summary of the findings of the various meta-analyses and other studies presented earlier: Meta-analyses of the experimental literature show that exposure to both nonviolent pornography and violent pornography affects both aggressive attitudes and behaviors, and that violent pornography does so to a greater degree. Exposure to nudity alone was systematically examined only in the experimental research on

aggression, and a significant decrease in aggression following such exposure was reported. The correlational data on attitudes do not reveal a similar effect as the experimental studies, but no analysis of the differences between nonviolent and violent pornography was possible here.

The meta-analysis of the correlational data on aggressive behavior focused on differences between rapists and nonrapists. This analysis showed no differences in age of first exposure or amount of exposure, but differences were evident in sexual arousal patterns and in the extent to which exposure to pornography led to some sexual act (masturbation, noncriminal, or criminal sex). Rapists were found to be more aroused by violent pornography than nonrapists and somewhat less aroused by consenting sex depictions. Both types of stimuli, however, were associated with greater likelihood of some form of sexual act by rapists. In addition, although there are only a very few studies in which the association between pornography use and degree of sexual aggression has been analyzed within the noncriminal population, such an association has consistently been found, particularly for violent pornography. Similarly, associations between pornography exposure, particularly violent pornography, and the reported likelihood of sexually aggressing, have also been consistently found.

Overall, then, there appears to be considerable consistency across the available literature. There is also some indication that the associations found between pornography use and sexual aggression may be due to differences at the more extreme ends of the distributions, both in terms of the content of the stimuli and the participants involved. In terms of content, there is much consistency for an association between exposure to violent pornography and aggressive responses. For nonviolent pornography, the effects are not as strong or consistent, but they also emerge quite reliably. Here, the differences may primarily be between those with relatively "heavy use" and others (e.g., see Frank, 1990). With this possibility in mind, we turn to the next major section of this article. Informed by the extensive review, we systematically examined a largely neglected aspect of the research literature, the possible association within the noncriminal population between pornography use and sexual aggression in naturalistic settings.

THE PRESENT RESEARCH

Importance of Effects

Clearly, no influence on human thinking or behavior works in a vacuum, and the influences of media combine and interact with a variety of other individual and cultural factors—sometimes counteracting them, sometimes reinforcing them, and at other times not having much

of any effect. It is important to keep in perspective the nature of the effects and associations that have been found for the research discussed. These have not been the wide-sweeping changes that some seem to assume are being suggested (e.g., Fisher & Barak, 1991). It would be unparalleled in media research if they were. Given the type and duration of exposures involved and the fact that the subjects are adults with relatively established attitudes and behaviors, the most that can be expected (if effects exist) in experimental studies is that such effects would be detected only with very careful and precise assessment that is specifically geared to the manipulations used. In the correlational research, it is also important to keep in mind that only relatively modest associations would typically be expected between a single variable, such as media exposure, and a complex set of attitudes and/or behaviors that are undoubtedly related to the interactions among many factors. Rosenthal (1986) has persuasively illustrated the social consequences of "small effects" typically found in research on media and antisocial behavior. He showed that although proportions of variance accounted for may appear low, the practical consequences can be very substantial.

On the basis of the research available, it is not feasible to gauge the relative importance of media influence generally, and of pornography specifically, in comparison to other factors. It is unlikely that in and of itself any type of pornography exerts a powerful effect on large numbers of people, but as concluded in the consensus statement of the social scientists participating in the Surgeon General's Workshop, "Pornography does have effects; it is just not yet known how widespread or powerful they really are" (p. 19, Mulvey & Haugaard, 1986). As discussed subsequently, it may be that the effects of pornography are important for some individuals but not for others and that they may be relatively powerful only as they interact with some other factors.

Individual Differences and Synergistic Effects

In fact, one of the problems in the literature has been the use of oversimplistic models, including the lack of sufficient consideration of the role of individual and cultural differences as moderators of media influences. In addition, researchers have largely attempted to consider the role of media stimuli in isolation from other variables, often not giving sufficient consideration to the role of the media in complex interactions with other influences. As suggested by Malamuth and Billings (1986) and documented in the Allen et al.'s (2000) meta-analysis comparing rapists and nonrapists (see previous section of this article), focusing only on quantity of exposure may be an oversimplified approach. Sexu-

ally explicit media's degree of influence on a person may largely depend on how that exposure interacts with other influences.

Individual Differences as a Key Moderator

Researchers in this area have repeatedly suggested that effects are not necessarily the same upon all individuals and in all environments (Malamuth & Briere, 1986). Therefore, when analyzing the influences which sexually explicit stimuli have upon a person, moderating factors must be taken into consideration that may justify very differing conclusions for various people. Based on research to date, we believe that important moderators include the cultural background milieu of the person (e.g., a culture that emphasizes or de-emphasizes equality between the genders), the individual's home background (e.g., open or highly restricted education about sexuality), individual's relatively stable personality characteristics and predispositions (e.g., dispositionally hostile or not, intelligence level), the particular content of the stimuli (e.g., sexually violent or not), the current temporary emotional state of the person (angered or not), and the environment in which exposure occurs (e.g., permissive vs. nonpermissive for aggression). Particularly relevant to the current research, there is increasing evidence from various experimental studies that the moderator variable of men's stable personality characteristics and predispositions is especially important: Those scoring relatively high in pretest measures of risk characteristics (e.g., self-reported attraction to sexual aggression, hostile masculinity and/or low intelligence) have shown the most pronounced negative effects of exposure to certain sexually explicit materials, particularly those that combine sex and violence (e.g., Bogaert, 1993; Bogaert, Woodard, & Hafer, 1999; Malamuth & Check, 1983, 1985). Indeed, in much of this type of this research, it is only these type of men who show evidence of significant negative effects. A variety of dependent measures have been used in studies showing such moderating effects of individual predispositions, including fantasies (e.g., Malamuth, 1981; Malamuth & McIlwraith, 1989), beliefs in rape myths (e.g., Malamuth & Check, 1985), sexual arousal (e.g., Allen et al., 2000; Malamuth & Check, 1981) sexually suggestive behavior toward a female confederate (Bogaert et al., 1999; McKenzie-Mohr & Zanna, 1990) and laboratory aggression (Donnerstein & Berkowitz, 1981; Malamuth, 1983).

The results of these studies also suggest a bidirectional relationship: Men who are relatively high in risk for sexual aggression are more likely to be attracted to and aroused by sexually violent media (e.g., Malamuth & Check, 1983) and may be more likely to be influenced by them (e.g., Malamuth & Check, 1985). This work dovetails well with the

emphasis in social learning theory on the concept of *reciprocal determinism*, defined as “a continuous reciprocal interaction between personal, behavior and environmental determinants” (Bandura, 1977, p. 194). This concept encompasses bidirectional influences, whereby individuals’ characteristics (e.g., gender, personality, etc.) may affect selecting or attending to certain content in the media and the extent to which such experiences are pleasurable or otherwise reinforcing.

Although we believe that each of the methodologies brought to bear on this topic has certain advantages and disadvantages, reviewers skeptical of the validity of findings in this area have been particularly dismissive of the value of laboratory research (e.g., Lab, 1987). For example, Fisher and Barak (1991) summarized their own conclusions and those of various other writers representing this point of view when they concluded the following: “Hence, the poor analogues provided by laboratory research may tell us little or nothing about the relation of pornography and aggression in the real world. . . . While ecological validity may be irrelevant to the detection of theoretically interesting relationships, it is critical to the construction of research which seeks to model the naturally occurring consequences of exposure to pornography” (p. 77).

Importantly, the present research addresses this issue by modeling the relationship between pornography consumption and aggression in naturalistic settings. We will, nonetheless, have the opportunity of examining the degree of similarity between our conclusions with that from other methodologies. In particular, we will investigate in “real world” settings the role of the variable that to date has been found in experimental research (primarily conducted in laboratory settings) to most consistently moderate the effects of exposure to pornographic stimuli: Individual differences among men at risk for sexual aggression (see references previously listed). The advantages and disadvantages of our methodology complement those of laboratory studies. Thus, the degree to which our findings are similar to those of laboratory studies will affect considerably the confidence we can have in the generalizability of the findings emerging from these distinct methodologies.

Two more key issues have been emphasized by critics of laboratory research (e.g., Fisher & Barak, 1991; Kutchinsky, 1991). These concern the “unrepresentativeness” of stimuli and of subjects. First, these critics have noted that sexually violent depictions, which have been used in a substantial number of the laboratory studies documenting negative effects, constitute a small percentage of the pornography market. Second, while acknowledging that reliance on university students may actually “result in serious underestimation of pornography-induced harm” (Fisher & Barak, 1991, p. 78), these writers have noted that the

reliance on volunteers rather than representative samples may seriously skew the conclusions in the direction of accentuating any effects. In the research described herein, we have addressed all three of these objections by (a) using a representative national sample of men (who achieved any form of post-high school education), (b) operationally defining pornography as the use of the most common form of sexually explicit media (i.e., magazines), and (c) studying aggressive behavior in naturalistic settings.

Correlational Studies

The type of methodology used in the present research is similar in some respects to the few earlier correlational studies examining whether those individuals who consume more pornography have more sexually aggressive tendencies and/or behaviors. However, in the previous studies, researchers relied on convenience samples of volunteers who are not representative of any larger population. Those researchers also did not control for other key risk factors associated with sexual aggression. Moreover, previous researchers have often failed to properly examine the role of key moderator variables that may reveal different relationships within certain subgroups in the samples. The current research substantially improves upon previously published studies by overcoming these limitations: We not only use a representative sample but include critical control variables, and we specifically examine potential interaction or moderator effects.

Competing Views

Three views may be described that helped guide the analyses reported.

Model I: Pornography as a Form of Sexual Communication

Proponents of what has been labeled by Malamuth and Billings (1986) as the *Sexual Communication* approach contend that pornography is essentially communication relating to sexuality. According to this position, consumers are attracted to pornography because they desire to fulfill their sexual curiosities and needs. This interest in pornography has no connection to coercive behavior against women. This view is most often associated with the conclusions of the 1970 Presidential Committee on Pornography but also continues to be held by various researchers (e.g., Abramson & Pinkerton, 1995). This position explains any associations that might be found between interest in sexually explicit media and coercive behavior as due to confounding with other variables. For example, men who are more sexually promiscuous might

be more likely to be attracted to sexual media, and some of these men may also be more likely to engage in coercive sexual acts. According to this reasoning, research in which controls are used to eliminate such confounding should result in the disappearance of a spurious correlation between pornography consumption and aggression.

*Model II: Pornography as a Contributing Cause to Aggression
Against Women*

The second model, which includes two somewhat different versions, is that pornography consumption can be a contributing cause of aggression against women. Russell (1988, 1998) has argued for a "direct effects" model, emphasizing a powerful direct connection between exposure to pornography and aggression against women. A somewhat different perspective is suggested by the "indirect-effects" model of Malamuth and Briere (1986). It considers the mass media as one among the many social forces that may, in interaction with other individual factors, influence the development of attitudes that condone sexual aggression. The combination of these attitudes with other risk factors may in turn sometimes contribute to antisocial behaviors against women.

Model III: Aggressiveness as a Cause of Interest in Pornography

A third view is that pornography use is a consequence or a reflection of aggressive tendencies toward women, not a cause of such aggression. There are at least two potential interrelated processes that may be proposed here. The first suggests that men who are hostile and, therefore, aggressive toward women are attracted to the kinds of images that portray and reinforce their already held hostile attitudes and behaviors. This view suggests that the aggressive tendencies directly lead to attraction to the kinds of images found in some pornography that portray women as available, vulnerable, and controlled. A second explanation proposes that men who act coercively toward women often have difficulties in their sexual interactions with women and are, therefore, attracted to fantasized depictions of sex. They have difficulty in maintaining relationships with women, due to such underlying factors as lack of social skills, strong desire to control, and social isolation from women. Their lack of success with women has made them more likely to seek sexual gratification in other ways than in long-term sexual relations with women, and they are, therefore, more likely to regularly use pornography.

In the research described herein, we do not seek to definitively pit the predictions of Models II and III (pornography as a cause or as a symptom) against each other, as cross-sectional correlational data can-

not fully disentangle cause and effect relationships, no matter how many statistical controls are applied. Therefore, our analyses are primarily directed at examining whether pornography consumption may be considered a risk factor (or a marker) for sexual aggression, after controlling for other key factors. We emphasize that the analyses cannot determine a cause-and-effect basis for the association observed in a way comparable to studies using random assignment. However, our findings need to be considered in the larger context of other research in this area that has employed differing methodologies. Each methodology has clear strengths and shortcomings, and therefore a multimethod strategy using complementary methodologies that balance each others' strengths and weakness may be illuminating. Moreover, as Ketelaar and Ellis (2000) aptly noted, scientific research seldom fits a "Popperian" approach whereby a single critical study can either terminally falsify or confirm a particular model. Thus, we favor a "Lakatosian" approach wherein the cumulative weight of evidence pertaining to differing models leads to progress. After presenting the results from a series of analyses conducted here, we hope to show how these findings may be embraced within a more comprehensive framework that provides a basis for an integration of a much wider sphere of pornography related research reviewed in the previous section of this chapter.

Method

Overview of Current Research

In order to present a cogent discussion of the data described in this article, first it is necessary to describe theoretical and empirical underpinnings of our larger research program focusing on aggression against women. In the current research, we present a series of analyses using a data base that had earlier been used to identify the major predictors of men's sexual aggression against women. Using structural equation modeling, Malamuth, Sockloskie, Koss, and Tanaka (1991) integrated the key factors of individual differences among men in the general population that have been identified in the research literature as predictors of sexual aggression against women. These individual-differences variables included both life history (i.e., developmental) and current personality characteristics of men. Data were gathered from a nation-wide representative sample of about 3,000 males enrolled in any form of post-high school education (e.g., trade schools, colleges, universities, etc.). The data consisted of subjects' responses to self-report measures and recollections of earlier experiences.

Malamuth et al. (1991) showed that coming from a home with parental violence and/or child abuse was associated with a higher rate

of delinquency in adolescence, which in turn was strongly predictive of greater sexual promiscuity (i.e., a short-term mating strategy). This path was labeled the Sexual Promiscuity (SP) path and predicted Coercion Against Women, as did the other major constellation, the Hostile Masculinity (HM) path. Together, these two paths accounted for 78% of the latent variance of Coercion Against Women, which was indicated by scales measuring sexual and nonsexual aggression against women. It should be noted that only two constructs—HM and SP—directly contributed to the construct labeled Coercion Against Women. The other factors in the model predicted Coercion Against Women indirectly, via their prediction of the two more proximate predictors of HM and SP. In subsequent follow-up analyses of sexual and nonsexual aggression separately, Malamuth et al. found that sexual aggression was best predicted by relatively high scores on both HM and SP, whereas nonsexual aggression was found to relate primarily to the HM dimension.

The model developed by Malamuth et al. (1991) labeled, the Confluence Model of sexual aggression, has been used as an organizing framework for the research to be described here, and we suggest that it can be similarly useful for addressing other questions in related areas. The analogy of a jigsaw puzzle may apply. Once certain key pieces have been identified, it is much easier to find the “right” positioning of the others. In a similar vein, we suggest that the two major constellations of characteristics of sexually aggressive men identified in this model provide the key pieces that can help position the role of other factors.

The Confluence Model may be best described as a “cumulative-conditional-probability” model. Belsky, Steinberg, and Draper (1991) provided an apt description of this type of a model

when antecedent conditions A, B, and C obtain, the probability of D is greater than when only two of these antecedent conditions obtain, and that the probability of D is even less when just a single such condition obtains. Thus, whereas a path-oriented theory predicts that an effect will obtain only when the immediately preceding influential condition exists, a conditional theory presumes multiple paths to an outcome and greater and lesser probabilities of an outcome ensuing given varying antecedent conditions. (p. 651)

In other words, such a model may suggest two interrelated aspects: (a) The likelihood that a certain factor will occur is affected by the presence versus absence of certain antecedent factors; (b) When a combination of certain antecedent factors in a sequence exists, the probability of a particular outcome is greater than when only some of these exist. We further suggest that although each antecedent factor independently contributes to a higher probability of the outcome, the combination of

certain factors has more than a simple additive effect on the likelihood of the outcome (e.g., a “synergistic” effect).

Our approach also has some similarity to some other theorizing, such as that of Sternberg and Lubart (1999) regarding creativity. These theorists have noted the utility of a multivariate approach in predicting creative performance. Their model includes intellectual processes, knowledge, intellectual style, personality, motivation, and environmental context as converging factors. Creative performance results from a confluence of these elements. Similarly, we maintain that sexual aggression is the result of the interactive rather than simply the additive combination of the two constellations of HM and SP.

In a recent meta-analytic review of studies focusing on attitudes toward rape, Anderson, Cooper, and Okamura (1997) reported results that supported a number of elements of the Confluence Model, particularly the relationship between such attitudes and sexually aggressive behavior, as well as the independence of the SP and HM constellations. In some of our later work (see Dean & Malamuth, 1996; Malamuth, 1998b) a third constellation was added to the other two “risk” constellations as a “protective” or countervailing one that can serve to reduce the risk of sexual aggression. In the current work reported herein, we do not include this constellation.

Various successful replications and extensions of the Confluence Model have been reported both with American samples (e.g., Anderson, 1997; Christopher, Owens, & Stecker, 1993; Wheeler, George, & Dahl, 1999) and in Singapore (e.g., Lim & Howard, 1998). It has recently been described as “the model that currently has the most empirical support.” (Zurbriggen, 2000, p. 559).

Sampling Procedures

The sample used for the present research is described in detail in Koss, Gidycz, and Wisniewski (1987). An attempt was made to survey a representative sample of the U.S. college population. Because topics such as rape are controversial, some schools and individuals targeted by a systematic sampling plan refused to participate. Therefore, no design could be expected to result in a purely random sample. However, the present sample is probably the closest approximation to a random sample of the college population that can be obtained within the constraints imposed by the topic’s sensitivity.

Using enrollment data provided by the Department of Education, schools were randomly selected to participate. If a school did not agree, a replacement was obtained using previously matched homogeneous clusters. Of the institutions in the final sample, 19 were first choices

and 13 were replacements. Within schools, a random selection was made of classes, with appropriate alternates in instances when those classes could not be used. Participants completed anonymous questionnaires. Fewer than 2% chose not to participate.

About 4 out of 10 Americans of college age attend college (U.S. Bureau of Statistics, 1990). Therefore, the current sample appears to have considerable generalizability to a large proportion of the general population that is of the age of particular interest. However, some caution may be needed in generalizing from the present sample to men identified by the judicial system, since the latter group might have engaged in more extreme and brutal acts and/or be more likely to have aggressed against strangers rather than acquaintances or intimates.

Participants

The original sample consisted of 2,972 men with a mean age of 21. Eighty-six percent were White, 6% Black, 3% Hispanic, 4% Asian, and 1% Native American. Koss et al. (1987) presented a detailed analysis showing that this sample is representative of the college population. Here we included only heterosexuals or bisexuals, and we eliminated those with missing data on the dependent measures. For those missing data on some independent variables, they were replaced by the mean score for the entire sample, a conservative procedure that typically reduces rather than accentuates group differences.

For analyses that included the nonsexual aggression measure, the sample size ranged from 1,713 to 1,760 men. The major reason for about 30% of the sample not completing the nonsexual aggression measure seems to relate to its appearance on the last page of the questionnaire. In contrast, the sexual aggression measure appeared near the middle. Although the questionnaire had been pretested for a "typical" class session, at some schools the time available to respondents was shorter than in others. As well, some questions, such as those concerning sexual aggression, used a "funnel" format so that those indicating having engaged in certain behaviors provided more information about them. Consequently, they needed more time. This may have resulted in difficulty in completing the questionnaire within the time allotted at some schools. Evidence supporting this reasoning showed that subjects not completing the entire questionnaire had significantly higher scores on measures such as sexual aggression than those completing it.

Measures

We provide here summary information regarding some of the key measures used in the present analyses. Detailed information on all of

the other measures may be found in Malamuth et al. (1991).

Assessing Pornography Use

In the present study, we operationally defined the pornography variable on the basis of degree of exposure to sexually explicit magazines. Sexually explicit stimuli taken from such magazines have been used often in laboratory studies focusing on the effects of pornography on aggression against women (e.g., Donnerstein et al., 1975; Malamuth, 1981), and they are very widely distributed (Attorney General's Commission on Pornography, 1986). Correlations, if any, found between consumption of these types of stimuli and individual differences in aggressive behavior are not easily attributable to some atypical or "fringe" materials uniquely consumed by a small percentage of the population.

Participants were asked to respond to the following question, which inquired about their usage of the leading men-oriented sexually explicit magazines: "How often do you read any of the following magazines: *Playboy*, *Penthouse*, *Chic*, *Club*, *Forum*, *Gallery*, *Genesis*, *Oui*, or *Hustler* (Check one)." This question was followed by a 4-point scale: *Never* (1), *Seldom* (2), *Somewhat frequently* (3), *Very frequently* (4).

There are a number of limitations in this assessment. One of these was the use of only a single item to measure the use of sexually explicit magazines. Further, we asked subjects to indicate their perceived frequency of exposure rather than providing information on a more "objective" scale (e.g., how many times a week, for how long, etc.). On the other hand, including a multi-item assessment of pornography use might have made subjects more self-conscious about this particular focus and would have reduced the feasibility of assessing the various other relevant risk factors with the limited time available in this national survey.

Coercion Against Women

Sexual aggression. The Koss and Oros (1982) 10-item scale was used to assess sexual aggression ($\alpha = .70$). Koss and Gidycz (1985) presented data regarding its reliability and validity. Although most researchers have only asked subjects to indicate whether they had ever committed any of the various coercive acts described (e.g., using a position of power over a woman to get her to engage in unwanted oral sex, holding a woman down and causing her pain in an attempt to get her to engage in unwanted intercourse, etc.), here they also indicated the frequency of such behavior since the age of 14, as well as within the last school year. We used the former frequency data but the results are very similar if the latter frequencies are used instead. Each of the 10 items

comprising this scale were coded 1 if the subject never committed the act, 2 if only once since the age of 14, 3 if twice, etc., up to a maximum of 6 if five or more times since age 14. The inclusion of frequency information made the assessment of sexual and nonsexual aggression similar, as both included a frequency component.

Only 16% of rapes are reported to police (Kilpatrick, Edmunds, & Seymour, 1991). Of those reported, only about half result in filing charges (McCahill, Meyer, & Fischman, 1979; also see Frazier & Haney, 1996; Horney & Spohn, 1991). Decisions about charges are affected in part by the offender's race and socioeconomic status (Frazier & Haney, 1996; Frohmann, 1991, 1997, 1998). The conviction rate for simple rape ranges from 9-25% in Philadelphia and Washington, D.C. (Weninger, 1978; Williams, 1981). The jury leniency for simple rape (acts among acquaintances when force was limited to that necessary to complete intercourse against consent) is tied for the highest of any crime and is much higher than any other crime against the person of equivalent severity (Bryden & Lengnick, 1997). These sources of evidence suggest that incarcerated samples represent only a fraction of those who commit rape and are biased toward persons of minority and lower socioeconomic status. Therefore, obtaining data from a random sample within the general population provides another important source of information about such acts.

Questions may be raised about the validity of self-reported sexual and other behaviors. The accuracy and truthfulness of self-reports on the Sexual Experiences Survey (SES) measuring sexual aggression have been investigated (Koss & Gidycz, 1985). The Pearson correlation between a man's level of aggression as described on self-report and as given in the presence of an interviewer was .61 ($p < .001$) (Koss et al., 1987).

Nonsexual aggression. The 10-item Conflict Tactics Scale measured both verbal and physical aggression ($\alpha = .87$) by including behaviors such as arguing heatedly, yelling and/or insulting, pushing, hitting the other person, and hitting with something hard. (We used the original version of the scale, which did not include items such as using guns, because with the type of population studied here such behaviors are very seldom reported.)

Using 5-point scales ranging from *never* to *more than once a month*, subjects indicated the frequency with which they engaged in such behaviors against a female during the last school year in the context of conflict or disagreement.

Sexual Promiscuity

Two items, age of first sexual intercourse and the number of sexual intercourse partners since the age of 14, measured the latent variable

labeled SP. The first was a 10-level item ranging from *before the age of 15 to 22 or never*. If a person was below the age of 22 and reported not having engaged in intercourse, the respondent's current age was coded for this item. The number of sexual intercourse partners since age 14 was assessed using an 8-point scale ranging from *none to over 50 people*. These two variables have been used frequently to assess sexual "acting out" (Elliott & Morse, 1989) and are key dimensions used by some evolutionary psychologists to define an "r" strategy (relatively high quantity rather than quality investment) of reproduction (Ellis, 1991). Newcomb and Bentler (1988) found that early sexual promiscuity was a strong predictor of a life-style pattern characterized by more promiscuous and more frequent sexual behavior. Others have suggested that early sexual promiscuity often is associated with and seems to temporally follow general deviance and problem behaviors (Elliott & Morse, 1989).

Hostile Masculinity

Two scales were the indicators of an HM latent factor. The first, Negative Masculinity, was included as a personality measure associated with coercion in general. It was developed by Spence, Helmreich, and Hohan (1979) and consists of eight items ($\alpha = .79$). Subjects indicated on 5-point scales ranging from *not at all like me to very much like me* whether brief statements applied to them (e.g., "I am a bossy person." "Most people are out for themselves. I don't trust them very much.")

The second, Hostility Toward Women, was assessed by the 30-item Hostility Toward Women (HTW) scale ($\alpha = .80$) (Check, 1985; Check, Malamuth, Elias, & Barton, 1985). Reliability and validity data were presented by Check (1985). Subjects indicated whether the statements were true or false. Examples are "I feel upset even by slight criticism by a woman," and "I rarely become suspicious with women who are more friendly than I anticipate."

Results

We used several statistical techniques. First, we used a series of structural equation models (SEM) in following-up the previous work of Malamuth et al. (1991), but here we added Pornography Use to the set of variables examined by Malamuth et al. in their model of the characteristics of men who commit coercion against women. For the SEM analyses, the sample consisted of 1,713 men for whom all of the measures were available (e.g., both sexual and nonsexual aggression). Second, to utilize the full sample available for the sexual aggression measure only and to test interaction and related effects we employed regression analyses and conducted a series of follow-up analyses of variance. For these latter

analyses, we focused on the sexual aggression measure and thereby used the larger sample. Typically, it used 2,652 participants, but in some analyses the number was slightly higher due to replacement of missing data on the predictor variables. Whenever replacement was used, the conservative procedure of using the entire sample's mean was used.

Analyses Using Structural Equation Modeling

Technical Information About Evaluating Model Fit

Typically, there are two ways to evaluate the degree of fit of a model in SEM. The first involves the acceptance of the null hypothesis using the chi-square statistic. However, Bentler (1995) provided several circumstances when this statistic can result in misleading conclusions. One problem with this evaluative method is statistical power; large data sets will have high statistical power increasing the probability of detecting trivial differences.

Considering the size of the data sets being employed here, it was extremely unlikely that any of the models would be accepted according to the chi-square statistic alone. The other method of evaluating the fit of a model involves comparative fit indexes, which have become widely used in recent years. One index, the Normed Fit Index (NFI; Bentler & Bonett, 1980), ranges from zero to 1 and indicates the degree of fit of a hypothesized model compared to a baseline/null model. Bentler and Bonett recommended accepting NFIs of .90 or greater as indicative of a good fit. Although this index can be problematic in small samples (Maruyama, 1998), the sample size used here is more than adequate. The Comparative Fit Index (CFI; Bentler, 1995) is another index for evaluating model fit, but, unlike the descriptive nature of the NFI, this index was developed to measure the comparative reduction in noncentrality proposed as a population measure. Typically, models with a fit index above .90, without correlated error terms, are viewed as being acceptable in a statistical sense (Bentler, 1995). Because these indexes are not affected by statistical power per se, this will be the preferred method of evaluating the models tested in this paper.

To simplify presentation, in the SEM models shown herein, we only present the essential information to evaluate the model fit. We present pertinent information regarding the coefficients and their level of significance of relevant paths, model fit indices, and when relevant, the suggestions of the Lagrange Multiplier (LM) Test (modification index for adding parameters; Tabachnick & Fidell, 1996) that indicates whether certain parameters should be added to improve the fit of the model (see further discussion of the utility of this test later in this review). In addi-

tion, in the accompanying figures, we present the amount of variance accounted for in each construct, rather than following the convention of presenting the residual unaccounted variance (for the reader's ease).¹

Initial Model Without Pornography Use

Presented in Figure 1 is the model published by Malamuth et al. (1991). As noted, the amount of variance accounted for is presented. As described in detail by these investigators, the overall fit of the model was very good. It was successfully replicated in two randomly split halves of the entire sample, and it accounted for a large percentage (78%) of the variance in the latent construct of Coercion Against Women (which included both sexual and nonsexual aggression against women).

Models Including Pornography Use

We began to explore the role of pornography by testing the hypothesis that exposure to sexually explicit media was associated with SP only (see Model I, the Sexual Communications Model). We conducted two analyses with the pornography variable added to Malamuth et al.'s (1991) model. In one case, a "causal" path was included from SP into Pornography Use, whereas in the second case the path was reversed in its "causal" direction. In both instances the paths were highly significant. We present a summary of the first of these models (see Figure 2), which shows a highly significant path from SP into Pornography Use (path coefficient $\beta = .28, p < .001$).

The fit indices indicated good fit for the model generally (NFI = .93, CFI = .95). However, in the SEM analyses conducted here, we also relied on the LM Test to evaluate whether associations with Pornography Use were sufficiently accounted for. The LM test asks "which parameters, if any, should be added to a model" (Tabachnick & Fidell, 1996, p. 758). Although certain usages of modification indices designed for improving model fit are questionable, Maruyama (1998) has endorsed the type of strategy used here for evaluating whether variables "share additional sources of common variability beyond the specified factor structure" (p. 252). This modification index did reveal that there was a statistical association not yet adequately accounted for between Pornography Use and Coercion Against Women.

Models Assessing the Association Between Pornography Use and Coercion

Subsequent SEM analyses were designed to look at alternative mod-

¹Further technical details about the models are available from the authors.

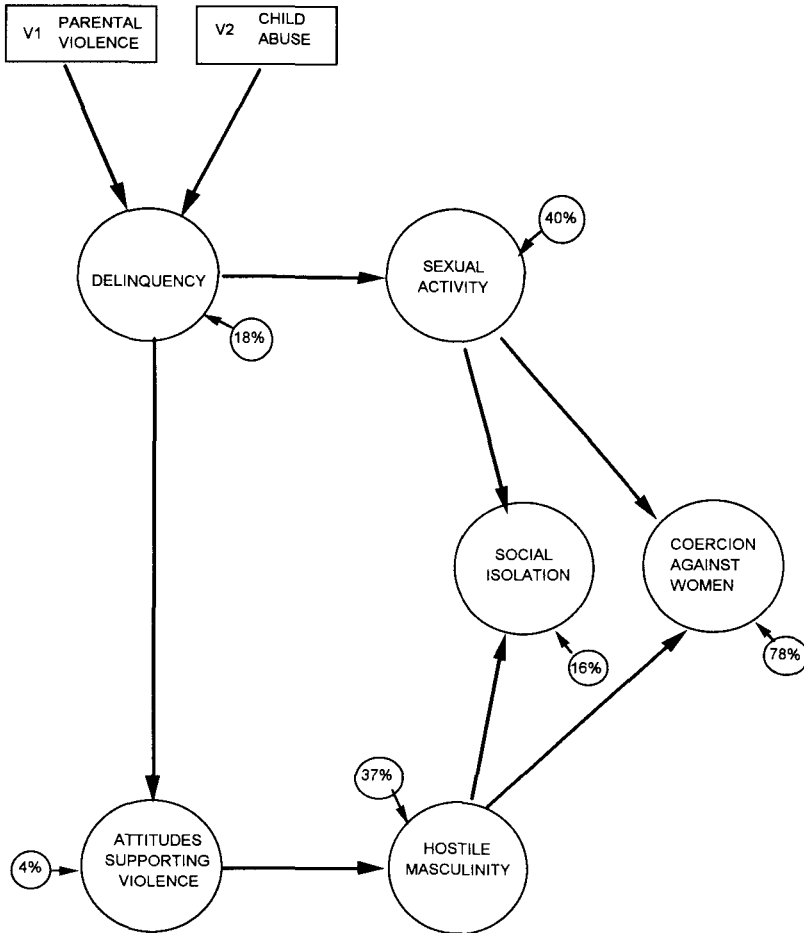


Figure 1. Modified version of the Confluence Model as published by Malamuth et al. (1991). Percentages indicate the amount of variance accounted for.

els that might account for this association between Pornography Use and Coercion Against Women. Two versions of the model that proposed that pornography has a contributing role to coercion against women were tested. One possibility is that there is a direct connection between these two constructs (see “direct causal” version of Model II). An alternative possibility is that there is an indirect path mediated by some of the other constructs assessed here. The test of these models is organized around several interrelated questions:

Is Pornography Use a direct and/or indirect contributor to coercion? Initially, we added to the model a “direct” path between Pornography Use and Coercion, which was statistically significant ($\beta = .09, p < .01$).

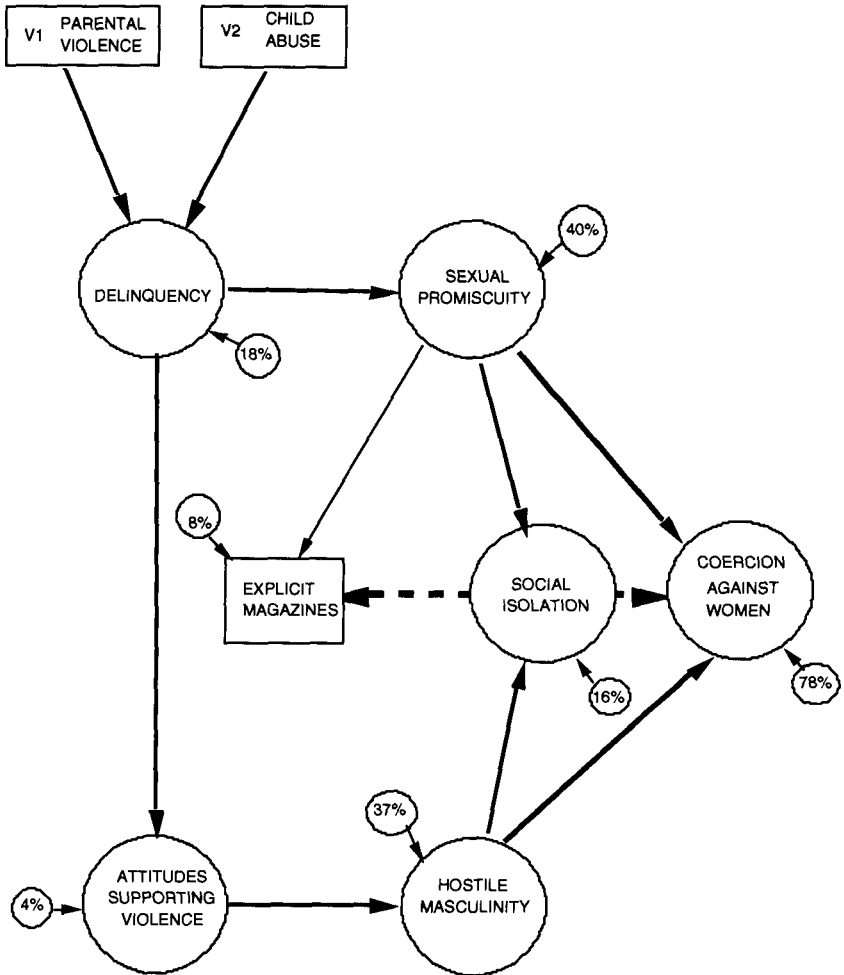


Figure 2. Addition of Pornography Use (sexually explicit magazines) to Confluence Model. The broken arrow indicates a statistical relationship not adequately accounted for by this version of the model.

However, the Lagrange Multiplier Test suggested that indirect paths should also be added to the model. Once the indirect paths were added, the direct path became nonsignificant and was eliminated. Although this might be interpreted to suggest that an “indirect model” may be the more appropriate, we do not believe that this statistical technique clearly justifies such a conclusion. It is not unusual with structural equation modeling that more than one model can be shown to fit the data equally well. The fit indices were similar for both models and the statistical “preference” for the indirect version needs to be treated with considerable caution here because it was not one specifically contrasting these two

versions of the model. Instead, it showed that if both direct and indirect paths are included, it is the indirect paths that are preferred. We therefore present the findings for the "indirect causal" model.

The model including indirect paths (see Figure 3) specified paths from Pornography Use into SP, Attitudes Supporting Violence Against Women, and HM. All three of these were significant: Pornography Use path to sexual activity yielded a beta of .26 ($p < .01$), the path to Attitudes yielded a beta of .11 ($p < .01$), and the path to HM yielded a beta of .11 ($p < .01$). The overall fit of the model was very good, $\chi^2(107, N = 1,713) = 260, p < .001, NFI = .93, CFI = .96$. The addition of the Pornography Use variable in the model increased the amount of variance accounted for in HM by 1% (from 37% to 38%) and similarly in Coercion Against Women by 1% from 78% to 79%. (The amount of variance accounted for in Attitudes Supporting Violence and in SP did not change because some of what was previously accounted for by other predictors was now "reassigned" to Pornography Use.) No other paths were suggested by the modification indices. Thus, in this model Pornography Use does indirectly affect Coercion Against Women via its impact on Attitudes Supporting Violence, SP, and HM. However, the overall increase in the amount of variance accounted for in each instance is modest. Some may perceive such an increase as of little importance but others may argue that even a 1% increased ability to predict coercive behavior in a large random sample of the population represents an important, policy-relevant gain.

Is Pornography Use a symptom of coercion? The next model tested was the Aggressiveness as a Cause of Interest in Pornography model (Model III), in which pornography is viewed as a symptom of Coercion rather than a cause. This possibility was tested by placing a path from Coercion into Pornography (see Figure 4). The overall fit of the model was very good, $\chi^2(109, N = 1,713) = 249, NFI = .94, CFI = .96$. This model's fit was very similar to that of the "indirect causal" model. The path from Coercion to Pornography yielded a beta of .33, $p < .001$ and, as shown in Figure 4, 11% of the variance of Pornography Use was accounted for in the model. No other paths were suggested by the modification indices.

The analyses conducted up to this point have indicated that (a) Pornography Use is related to Coercion Against Women, even after the expected association with SP has been accounted for, (b) the "direct causal" model, an "indirect causal" model, and a "symptom" model fit the data well, and there is no firm empirical basis for preferring one over the other. (Note that since these are not "nested models," statistical comparisons cannot be made between them.)

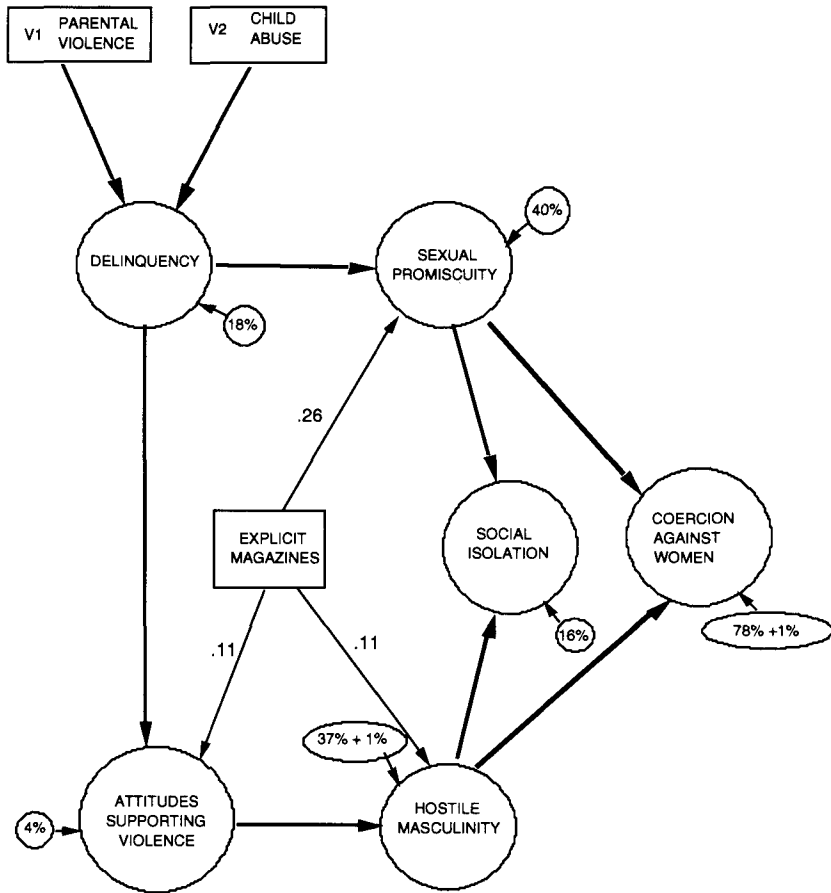


Figure 3. "Indirect causal" model with use of Sexually Explicit Magazines contributing to the prediction of Conflict With Women via its influence on Sexual Activity, Attitudes Supporting Violence, and Hostile Masculinity.

Regression Analyses

As noted earlier, in order to utilize the full sample available for the sexual aggression measure only and to test interaction and related effects, we used regression analyses and conducted a series of follow-up analyses of variance.

Main Effects

Regression analyses on the sexual aggression dependent measure were conducted by converting each of the constructs used in the SEM analyses into manifest variables. With the full sample ($N = 2,652$), we created standardized composite measures using the various components

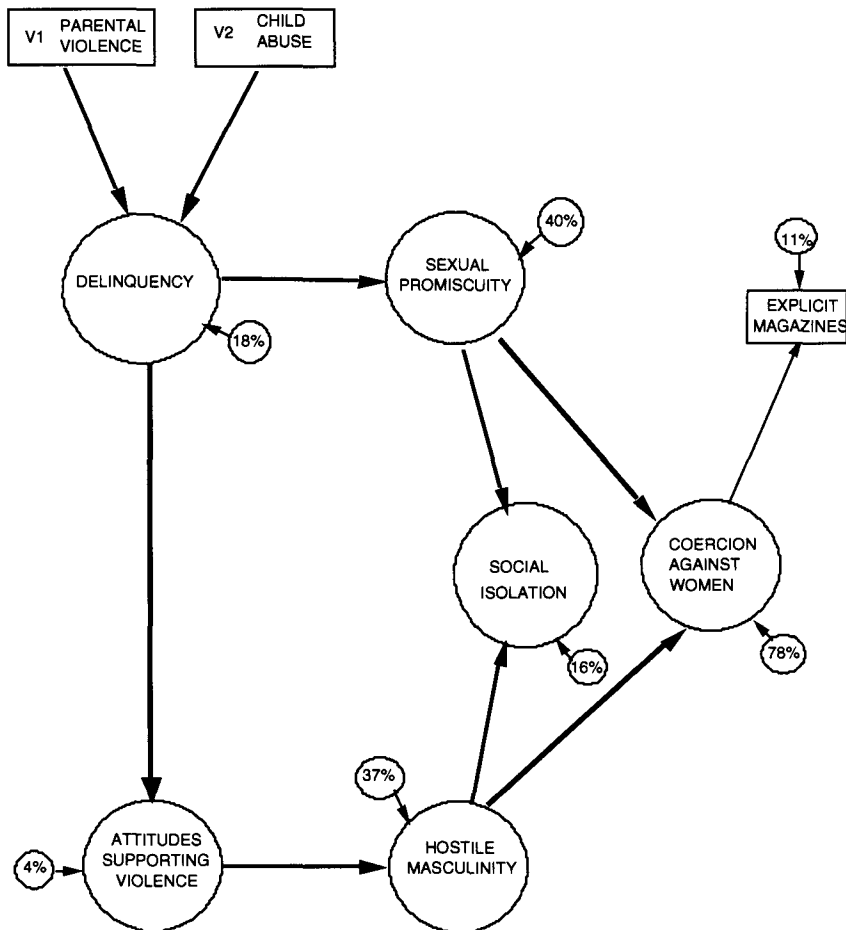


Figure 4. "Symptom" model whereby Coerciveness is a "cause" of greater consumption of sexually explicit magazines.

comprising the constructs studied (for details of the individual measures, see Malamuth et al., 1991). For example, for Abusive Family Background, the measures of nonsexual violence in the home and of sexual abuse were each converted to z scores and summed together to create a single composite score.

A hierarchical regression was used in which the five composite variables (Abusive Family Background, Delinquency, Attitudes, Promiscuity, and HM) were first entered into the regression analyses, yielding a Multiple R of .37, $F(5, 2646) = 84.3$, $p < .0001$. Then the Pornography variable was allowed to enter, and it did enter signifi-

cantly ($p < .0001$), with the Multiple R now at .38, $F(6, 2645) = 74.5$, $p < .0001$. Presented in Table 4 is a summary of the relevant statistics with all of these variables in the equation. Each of the six independent variables, including Pornography, contributed uniquely and significantly to the dependent measures of sexual aggression. This reinforces the SEM analyses indicating that even with all of the other previously identified “risk” predictors included or controlled for, the Pornography variable adds significantly to the statistical prediction of individual differences in sexual aggression. Although the overall amount of variance accounted for by the addition of the Pornography variable (about 1%) may not be considered large, the additional information shown in Table 4 indicates that with all of the variables in the equation, Pornography Use is comparable to several of the other predictors in the magnitude of its contribution to the equation. Whether Pornography Use should be considered only as the “last contributor” and, therefore, evaluated exclusively by the added overall percentage of the variance accounted for or whether it is more appropriate to evaluate it as with any of the other risk factors by virtue of contribution to the overall equation (e.g., by its beta weight or semi-partial correlation) depends on the investigator’s theoretical perspective. In any case, it is a significant statistical contributor, but the degree of its contribution may be judged quite differently depending on whether it is “the last added” or simply one of several potential risk factors considered. Moreover, the interaction and particularly the follow-up analyses reported subsequently clarify considerably for whom pornography use is of relatively little importance in predicting levels of aggression and for whom it appears to be a very important factor.

Table 4
Results of Regression Analysis Predicting Sexual Aggression Levels, Using the Full Predictor Set of Malamuth et al. (1991) and the Addition of Consumption of Sexually Explicit Magazines (Pornography Use)

Predictors	B	SE B	BETA	t
Family Violence	0.19	0.04	0.09	5.0***
Delinquency	0.14	0.04	0.07	3.7**
Attitudes	0.18	0.01	0.05	2.8*
Promiscuity	0.59	0.05	0.23	12.3***
Hostile Masculinity	0.36	0.05	0.14	7.1***
Pornography	0.26	0.06	0.09	4.7***

* $p < .005$. ** $p < .0002$. *** $p < .00005$.

Interaction Effects

Analyses were also conducted to test interaction effects with the Pornography variable. Following-up on the analyses reported by Malamuth et al. (1991), we focused on the two factors (SP and HM) shown to have direct effects on the dependent variable of sexual aggression. We first centered all of the variables (Cohen & Cohen, 1983) and entered the main effects for the Promiscuity, HM, and Pornography factors, each of which yielded a significant *F* Change score ($p < .0001$). We then added the two-way interaction between Promiscuity and HM, which had been found to be significant by Malamuth et al. (1991). It too yielded an *F* Change score which was significant ($p < .0001$). Finally we added to the equation the three-way interaction between Promiscuity, HM, and Pornography, which yielded an *F* Change that was significant ($p < .002$). Both the main effect and interaction results, therefore, indicated that the Pornography variable added to the prediction of sexual aggression beyond the factors previously studied by Malamuth et al. (1991).

Follow-Up Analyses

Informed by the analyses described previously and the Confluence Model of Sexual Aggression (e.g., Malamuth et al., 1991; Malamuth, Linz, Heavey, Barnes, & Acker, 1995), which has emphasized that degree of risk for sexual aggression is primarily determined by the confluence or interaction of HM and SP, we conducted additional analyses to clarify further the findings. We first sought to obtain a single "risk score" for sexual aggression based on the confluence of both of the key composite predictors of HM and SP. We therefore divided both of these dimensions, which were continuous variables in the regression analyses, into three levels each. We achieved this by separating them into those scoring in the lowest 25% of their respective distributions, those in the middle (between the bottom 25% and top 25%), and those in the highest 25% of the distribution. We then computed degree of risk for sexual aggression by multiplying these two three-level factors. Each person could achieve one of the following resulting product risk scores (1, 2, 3, 4, 6, or 9), thereby yielding six levels of risk.

We labeled those whose resultant score was a 1 (the product of being in the lowest level of both HM and SP) as "very low risk" for sexual aggression. Those who had received a score of 2 (by having a 1 on either HM or SP but a 2 on the other variable) were considered "low risk" for sexual aggression. Similarly, those who received a total score of 3 or 4 were also labelled as part of the "low risk" group. Those whose score was a 6 (resulting from having a 2 on either HM or SP and a 3 on the

other variable) were labeled as “moderate risk.” Finally, those who scored in the top levels on both HM and SP received a score of 9 and were labeled as “high risk” for sexual aggression. In total, there were six levels of risk.

Before presenting the results of analyses of variance (ANOVA), the following information about some simple correlations may be of interest: The simple correlations between Pornography Use and SP ($r = .17$), and with HM ($r = .17$) and sexual aggression ($r = .17$) were significant ($p < .001$), as was the correlation ($r = .21$, $p < .001$) between the Pornography Use variable and the Confluence Model risk levels (the cross-product of SP and HM).

We conducted an ANOVA using the sexual aggression scores as the dependent variable. The independent variables were the six-level “Confluence Model” risk variable crossed with the four levels of pornography consumption. (In addition to reporting information regarding significance testing, we present here the Eta Squared statistic, which is an effect-size statistic indicating the proportion of the variability of the dependent variable explained by the independent variable). This analysis yielded significant main effects for both the Risk variable, $F(5, 2829) = 22.38$, $p < .0001$ (Eta Squared = .038), and Pornography Use, $F(3, 2829) = 3.61$, $p < .0001$ (Eta Squared = .010), as well as a significant interaction between these two variables, $F(15, 2829) = 3.62$, $p < .0001$ (Eta Squared = .019). Both linear ($p < .0001$) and quadratic terms ($p < .001$) were significant.

Shown in Figure 5 are the mean levels of sexual aggression for each of the cells used in this analysis. In keeping with a moderator approach suggested by the findings of laboratory studies, the data indicated that at the lower levels of risk, there was relatively little difference in the levels of sexual aggression according to levels of pornography consumption (although, as described later, some differences do reach statistical significance). All of the average scores for the four low risk levels (from 1, very low risk, to 4, low risk) ranged from 0 sexual aggression to 1.5, with the majority being below 1, regardless of their levels of pornography use. In contrast, when the level of risk determined by the Confluence Model reached a moderate level (i.e., 6), the range of scores was between a mean of 1.5 ($n = 71$) for those indicating never reading sexually explicit magazines as compared to a mean of 3.0 ($n = 31$) for those who very frequently used such magazines. When the highest Confluence Model risk levels were examined (risk level 9), the men who indicated that they very frequently used pornography ($M = 7.78$, $n = 27$) appeared to score much higher on sexual aggression than any other group (see comparisons that follow). It

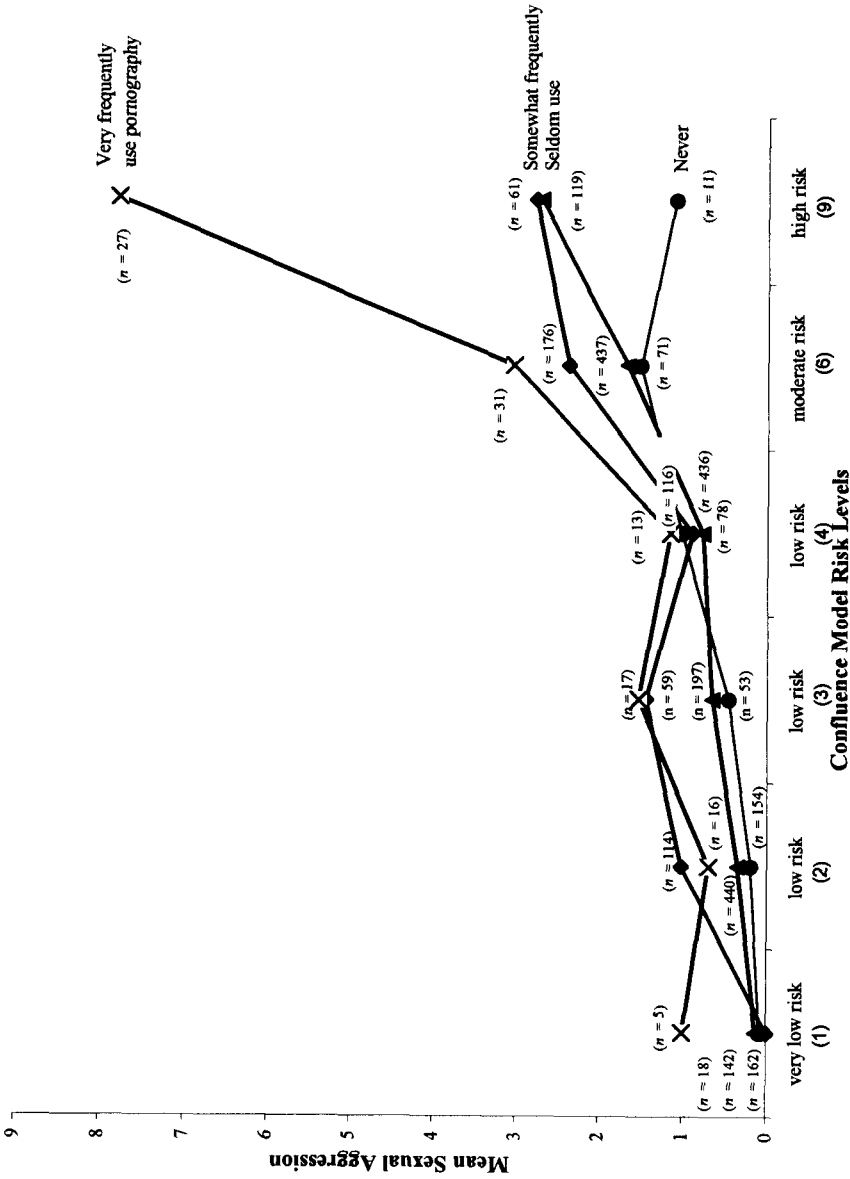


Figure 5. Mean sexual aggression as a function of Confluence Model's risk levels (i.e., the cross-product of Hostile Masculinity and Sexual Promiscuity) and four levels of reported use of sexually explicit magazines (Pornography Use). (Note: Numbers in parentheses indicate the number of participants in each condition.)

is this group that appears primarily responsible for the interaction effect observed, suggesting a particularly dangerous combination when there is a high Confluence Model risk score and very high pornography consumption.

Within-Groups Analyses

To statistically compare the effects within the various risk levels, follow-up analyses were conducted. Analyses were conducted separately within (a) the low risk group (Levels 1 through 4), (b) within the moderate and high risk groups combined (Levels of 6 and 9), and (c) separately within the moderate (Level 6) and high risk (Level 9) groups.

Low risk groups combined. Initially, analyses were also conducted within each of the four low risk groups (ranging from 1 to 4 on the confluence risk levels) separately. Within each group, there was a significant main effect of Pornography Use, but individual post hoc comparisons among means sometimes showed that the highest group significantly differed from all others (e.g., in Risk Group 1) and in some cases none of the individual mean comparisons reached acceptable levels of significance. We judged it more appropriate to combine all of these four groups, based on both theoretical and empirical considerations.

Within this combined low risk category, a significant main effect was obtained using a one-way ANOVA, $F(3, 1916) = 7.76$. $p < .0001$, Eta Squared = .012. A linear trend ($p < .002$) was found. The resulting means were 0.40 for the Never Use, 0.52 for the Seldom Use, 0.99, for the Somewhat Frequently Use, and 1.12 for the Very Frequently Use groups. The linear trend was significant ($p < .002$).

Post hoc comparisons using Tukey HSD test showed that the Very Frequently group differed from the Never group ($p < .052$) only. The Somewhat Frequently group significantly differed from the Seldom ($p < .001$) and the Never ($p < .0001$) groups. No other comparisons were significant. These data therefore indicate that there is some relationship between pornography use and sexual aggression levels, even among low risk men, but that the differences, although statistically significant, are relatively minor (sexual aggression means ranging from 0.40. to 1.12)

Moderate and high risk groups combined. An ANOVA conducted within the combined moderate (Level 6) and high (Level 9) risk groups yielded a significant main effect of Pornography Use, $F(3, 929) = 11.89$, $p < .0001$ (Eta Squared = .037). Both linear ($p < .0001$) and Quadratic ($p < .004$) effects were found. Post hoc comparisons showed that the Very Frequently group was significantly different in sexual aggression from

all of the other groups ($p < .0001$) but that none of the other comparisons reached statistical significance.

Separate Analyses for the Moderate and for the High Risk Groups

Moderate risk group. The mean sexual aggression scores within this moderate risk group ranged from 1.5 ($n = 71$) for the Never Use sexually explicit magazines to 3.03 ($n = 31$) for the Very Frequently use pornography group. The ANOVA within this group was significant, $F(3, 711) = 2.88$, $p < .05$, Eta Squared = .012. There was a significant linear trend ($p < .03$). However, none of the individual group comparisons reached statistical significance.

High risk group. Within the high risk group (risk level of 9), the range of sexual aggression means was from 1.09 ($n = 11$) for the Never Use sexually explicit magazines group to 7.78 ($n = 27$) for the Very Frequently use group. An ANOVA comparing the four levels of pornography use revealed a very strong effect, $F(3, 214) = 6.45$, $p < .0001$, Eta Squared = .083. There was a significant linear effect ($p < .002$).

The difference is dramatic for the Very Frequently use pornography group, which has a mean of 7.78, whereas all of the other high risk groups have a mean of 2.77 or below (i. e., a range of sexual aggression from 1.09 for the Never Use pornography group to 2.77 for the Somewhat Frequently group). Individual comparisons among means showed that the Very Frequently group significantly differed from all other groups ($p < .007$), but that none of the other groups significantly differed from each other. In fact, in other comparisons, this high risk/high pornography group was found to be significantly higher than all groups in the entire sample.

Discussion

Focusing on the association between men's pornography exposure (measured by degree of exposure to sexually explicit magazines) and levels of sexual aggression, we attempted to integrate the data into a unified model. Previous researchers relied on unrepresentative convenience samples and often did not account for potential overlap between pornography use and other key risk factors. In the statistical analyses presented here, we used a large representative sample of all American men who attend some form of post-high school education. These analyses built upon earlier findings from which we were able to formulate a well-supported model of the key risk factors predictive of sexual aggression. This model identified the primary confluence of two constellations, labeled HM and SP. In earlier work, the interaction of these two constellations was found to predict individual differences in levels of sexual aggression. The research reported here added the variable of Pornogra-

phy Use to this Confluence Model. We examined various alternatives suggested by the research literature. The following is a summary of the findings and conclusions from these analyses.

In the first series of analyses we used structural equation modeling (SEM) and built upon the analyses previously reported by Malamuth et al. (1991). The dependent variable was a construct labeled Coercion Against Women, which included both sexual aggression and nonsexual aggression. In this first step, we added to the previously developed model only an association between SP and Pornography Use (operationally defined as the reported frequency of consumption of sexually explicit magazines). Our intent was to see if the association with sexual promiscuity might fully account for the role of individual differences in pornography usage, as suggested by the Pornography as Sexual Communication model (Model I). The data indicated that although there was a strong association between SP and Pornography Use, there remained some association between Pornography Use and Coercion Against Women, which still needed to be "accounted for" by further model development.

Further SEM analyses were consistent with both the Pornography as a Contributing Cause model (Model II) and Aggressiveness as a Cause of Interest in Pornography model (Model III). These data indicated that there is not a firm basis for preferring one over the other. Therefore, we cannot conclude on the basis of these analyses that pornography use is a cause or an outcome of sexual aggressive tendencies (or both), although the association between pornography and coerciveness does not appear to be a spurious relationship. Similarly, regression analyses showed that after controlling for the various factors identified as predictive of sexual aggression, Pornography Use still significantly entered the equation.

Additional regression analyses revealed significant interactions among HM, SP, and Pornography Use in predicting levels of sexual aggression. Follow-up analyses designed to explicate this interaction strongly supported the following conclusions:

1. High pornography use is not necessarily indicative of high risk for sexual aggression. Among men who are classified as being at relatively low risk for sexual aggression, based on their levels of HM and SP, there is only a relatively minor difference (though statistically significant) in sexual aggression between those who report different levels of pornography use (e.g., *never using it*, *seldom*, *somewhat frequently*, or *very frequently*). The clearest difference here was between those who reported *never* or *seldom* using it (average sexual aggression of about 0.40) as compared to those reporting *somewhat frequently* or *very frequently* (average sexual aggression of about 1.00).

2. In some circumstances, pornography use is indeed a very good “marker” of higher sexual aggression levels. When we considered men who were previously determined to be at high risk for sexual aggression (based on the risk factors of HM and SP), we found that those who are additionally very frequent users of pornography were much more likely to have engaged in sexual aggression than their counterparts who consume pornography less frequently. The strongest difference here is between high risk participants who report very frequent pornography use as compared to other high risk participants who reported varying lower levels of pornography use. Indeed, those who are at high risk for sexual aggression (based on the confluence of HM and SP) and reported very high pornography use were found to have very high average levels of sexual aggression (average of about 7.8) that differed significantly from all other groups in the entire sample. It should be noted, however, that although we have used some key statistical controls for overlap with other variables, any form of correlational analysis is limited by its inability to control for all such overlaps. In this regard, future researchers should particularly assess the potential overlap between very frequent use of sexually explicit magazines and use of other types of nonsexual and sexual media, including violent pornography. It is noteworthy, however, that in an experimental study (Check & Guloiien, 1989) examining the effects of exposure to “Nonviolent, dehumanizing pornography” over a total of three separate exposures, significant effects on various measures of sexually aggressive tendencies and behavior were found only for those who were habitually high pornography consumers. Although that study had a number of limitations noted by the authors, their data and the present findings point to the need in future research to more closely study habitually high pornography consumers.

The Importance of Representative Samples

In the present research, in contrast to earlier studies of this type, we used a representative sample of the population. To illustrate how non-representative samples may yield differing results, we examined what might have been the correlations found within our sample between pornography use and sexual aggression, if we had not had access to the full range of the distribution and had only sampled some portions (as is likely to occur in many convenience samples). In other words, we wanted to discover whether different magnitude of correlations would emerge if only certain portions of our full sample were used, possibly leading some reviewers to erroneously conclude that there was not a reliable association.

When we selected all of the participants except for those classified as being the very highest risk for sexual aggression, we obtained a relatively low correlation between pornography use and sexual aggression, $r = .12$ ($n = 2,644$). Similarly, if we used a subsample including only men from within the middle of our statistical distribution (groups 2, 3, and 4 in the classification described earlier) we obtain a correlation of only $.095$ ($n = 1,693$). In contrast, if we included participants only from the two extremes of risk (groups 1 and 9), the same analysis yielded a much higher correlation of $.30$ ($n = 445$). Correspondingly, even after adjusting for the differing sample sizes, it is not difficult to see how researchers obtaining such differing correlations (often relying on much smaller samples than in our subsample analyses) would reach what appear to be conflicting conclusions.

Toward an Integration of the Literature

In the research we have described herein, we first addressed the issues raised by critics regarding the limitations of laboratory studies. We conducted analyses of behaviors occurring in naturalistic settings and applied important controls. Results demonstrated strong support for the moderator approach, which we proposed and tested in prior laboratory and related studies. The findings obtained here may be viewed within the emphasis in our research program on the Confluence Model of sexual aggression (Dean & Malamuth, 1996; Malamuth, 1986, 1998a; Malamuth et al., 1991; 1995). When applying it to media influences, the issue becomes how different types of people seek out and respond to media content differently in accordance with their individual predispositions and their on-going social relationships (also see Allen et al., 2000). Put simply, if a person has relatively aggressive sexual inclinations resulting from various personal and/or cultural factors, some pornography exposure may activate and reinforce associated coercive tendencies and behaviors. In contrast, if a person has relatively nonaggressive sexual inclinations, pornography exposure may activate and reinforce associated noncoercive feelings and acts.

A number of recent "priming" studies are relevant to this analysis. The results of these studies suggest that priming sexuality-associated mechanisms (perhaps particularly via some of the types of images frequent in pornographic media) may activate power and hostility cognitions in men at relatively high risk for sexual aggression. For example, Bargh, Raymond, Pryor, and Strack (1995) subliminally primed sexually aggressive and nonaggressive men with power-related or neutral words. They found that sexually aggressive men had a habitual association between power and sex. Similarly, Zurbriggen (2000) found that such

strong power-sex associations predicted higher levels of sexual aggression. Leibold and McConnell (1999) used a sequential priming paradigm and found support for the Confluence Model's predictions (Malamuth, 1986; Malamuth et al., 1995) that sexually aggressive men, in contrast to their nonaggressive counterparts, are very likely to have habitual cognitive representations relating the concept of women to both sex and hostility.

Although they did not examine individual differences among men, in a series of three priming studies Mussweiler and Forster (in press) found that the mere presence of sexual stimuli may increase men's tendency to behave aggressively. In the first study, they demonstrated that sex-related prime words facilitated lexical decisions for aggression-related words. In the second study, sex priming was found to facilitate aggressive behavior. In the third study, they found that this facilitation was specific to aggressive behavior directed against a female target. We believe that it would be important in future research to use an individual difference variable of proclivity to sexually aggress, and we predict that the type of effects reported by Mussweiler and Forster will be moderated by this dimension.

Considering Media Effects

As we have emphasized throughout this article, the current data do not enable us to conclude which is the cause and which is the effect, nor to test directly bidirectional influences. The laboratory studies showing cause and effect of sexually violent media, as well as those indicating that even nonviolent graphic sexual media may increase aggression for some individuals (see meta-analyses by Allen, D'Alessio, & Brezgel, 1995; Allen, Emmers, et al., 1995 described earlier), do support the "pornography as a cause" interpretation of the current findings, at least as a serious potential under some conditions. At the same time, the fact that the clearest difference was between the high risk men who reported very frequently using pornography and all other men (also see Frank, 1990) also suggests a different speculation. It may be that there are certain compulsive characteristics of these individuals such that even "somewhat frequent" exposure to pornography (which may "satisfy" others) is not sufficient for these individuals, and they are constantly seeking more exposure to such stimuli. The heavy use of pornography, therefore, may be primarily a symptom of their compulsion, although it could also certainly "add fuel to the fire" and be a "tipping point" that in some cases moves a strong tendency beyond a threshold necessary to elicit actual behavior (Gladwell, 2000; Granovetter & Soong, 1983).

Cross-Cultural Comparisons

One of the most glaring apparent contradictions in the literature on pornography results from research conducted in different cultures (as well as in the different methodologies used). In research conducted primarily in Denmark (Kutchinsky, 1970, 1991) and in Japan (Diamond & Uchiyama, 1999), there has not been evidence of increased criminal sexual acts as a function of the wider availability of pornography. In commenting on such findings, Malamuth and Donnerstein (1984) suggested some time ago that "there may be considerable variations among individuals within a culture in susceptibility to media influences. Similarly, cultural factors may create major individual differences in the role and impact of media stimuli on members of differing societies" (p. 141). This point was also aptly made by Giglio (1985).

The cultural environment in each country is a factor to consider in understanding the prevailing public attitudes toward pornography. The Danes appear to enjoy a more natural approach to sex in general. Public nudity, for example, is more acceptable in Denmark than in the United States. . . . In a society where it is possible on a warm summer Sunday to visit the Rosenborg Palace in the heart of Copenhagen and see dozens of partially nude women in the surrounding gardens, usually accompanied by family or friends, without the slightest public disturbance, lends creditability to Kutchinsky's theory that the Danes lack the sustaining desire for pornography to make it a profitable domestic business. Imagine the consequences if the previous scene were to be shifted to Central Park in New York City. The likely disorder that would result in the Central Park scene when compared to the serene acceptance of partial nudity in Copenhagen illustrates most dramatically why, on sexual matters, Denmark is an improbable model for the United States to emulate. (pp. 289-290)

In keeping with the position that aggressive-sexual predispositions may moderate the impact of exposure to certain types of pornography, it would be expected that within countries such as Denmark, fewer men than in the United States are at high risk for sexual aggression. If this is correct, then the lack of an association between pornography use and sexual aggression would map nicely on to the findings we have obtained here. Although we do not have direct evidence bearing on this issue, there are some potentially relevant data. Zak and Knack (in press) compared the levels of trust that people had for each other in various countries throughout the world. They found strong differences, with countries such as Denmark being at the very highest levels of trust between people, and these levels were considerably higher than in the United States. To the extent that such general levels of trust may also be associated with trusting between men and women (an important component of the HM construct), men may be at relatively low levels of

risk for sexual aggression in a society such as Denmark.

Consider on a broader level the recent discussion by Glassner (1999) of research on the effects of media violence. Following the conservative commentator David Horowitz, Glassner wrote,

Viewers in Detroit, Michigan see the same TV shows as viewers in Windsor, Ontario, just across the river. Yet the murder rate in Detroit has been 30 times that in Windsor. TV shows do not kill or maim people. Guns do. It is unregulated possession of guns, more than any other factor, that accounts for the disparity in fatality rates from violent crimes in the United States compared to most of the world. (pp. 439-440)

We would argue that Glassner is erring by searching for the single cause or primary factor. In the context of the other factors contributing to the high rate of violence in Detroit, media violence may indeed play a role. Consider the "guns cause" that Glassner emphasizes. What if we point to a country, such as Israel, where many people regularly carry guns in the streets and in their homes, and yet the rate of violence and violent crimes has been far lower than in the United States? Does this mean that guns are not part of the confluence of factors that interact to affect violence in the United States?

Concluding Remarks

Although some risk factors may be considered more "primary" than others (e.g., media exposure may not be as initially formative as some early home experiences), overall one needs to consider the various interactive factors that can potentially act in a "synergistic" manner with other factors, exacerbating or counteracting them (see Malamuth & Addison, in press, for a discussion of a multilevel approach to understanding aggression). Different combinations of various risk and neutralizing factors can affect the probability of the occurrence of varied behavioral outcomes. Causation may not be best conceived, as in the legal system, only in terms of a "but for" approach (i.e., if it were not for that factor, the outcome would not have occurred [Hart & Honore, 1985]). Instead, scientific causal models may also be better framed in terms of the confluence of several factors, each of which potentially may not have a significant impact without the combined influence of other relevant factors. Further, the "cumulative-conditional-probability" conceptualization described earlier emphasizes that relevant factors are best conceived as affecting the probabilities of differing outcomes, not as necessarily "deterministic" of a particular outcome.

It is important to keep in mind that not only are pornographic stimuli only one part of a larger corpus of mass media images, but the role of media stimuli cannot be fully appreciated in isolation from other vari-

ables. Consideration must be given to the role of the media's complex interactions with other influences. As we have attempted to emphasize, depending on such factors as the cultural milieu, the individual's background, the particular content of the stimuli, the type of response focused on, and the way "harm" is defined, differing conclusions may result. Although sometimes these data may appear contradictory, a theoretical model that takes such distinctions into account is likely to reveal that the findings in this area are actually much more consistent. Associations between pornography consumption and aggressiveness toward women could be explained by a circular relationship between high coercive tendencies and interest in certain content in pornography, whereby aggressive men are drawn to the images in pornography that reinforce and thereby increase the likelihood of their controlling, impersonal, and hostile orientation to sexuality. The way relatively aggressive men interpret and react to the same pornography may differ from that of nonaggressive men. Clearly, the data showing particularly strong links for some men between sex, power, and, to some degree, aggression at both the arousal/emotional (e.g., Allen et al., 2000; Bernat, Calhoun, & Adams, 1999; Lohr, Adams, & Davis, 1997; Malamuth & Check, 1983; Malamuth, Check & Briere, 1986) and cognitive (Bargh et al., 1995; Leibold, & McConnell, 1999; Mussweiler & Forster, in press) levels are consistent with this hypothesis.

The current findings do suggest that for the majority of American men, pornography exposure (even at the highest levels assessed here) is not associated with high levels of sexual aggression (although aggressive tendencies may be expressed in other behavioral manifestations than in actual aggressive behavior when there is not the full confluence of factors that elicits actual aggression [e.g., Malamuth & Thornhill, 1994]). But among those at the highest "predisposing" risk level for sexual aggression (a little above 7% of the entire sample), those who are very frequent pornography users (about 12% of this high risk group) have sexual aggression levels approximately four times higher than their counterparts who do not very frequently consume pornography. Although not nearly as dramatic an elevation, the coercion levels found for similar risk subgroups (such as the moderate risk group who are very frequent pornography consumers) suggests the need for increased research attention on the use and impact of pornography in men at elevated risk for sexual aggression.

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