

EFFECTS OF REPEATED EXPOSURE TO SEXUALLY VIOLENT OR NONVIOLENT STIMULI ON SEXUAL AROUSAL TO RAPE AND NONRAPE DEPICTIONS*

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Summary—The major purpose of this investigation was to examine the effects of repeated exposure to sexually violent stimuli (SVS) in relatively 'naturalistic settings' on sexual arousal to rape and nonrape stimuli. Repeated exposure effects using nonviolent erotica were also examined. Sixty-nine male *Ss* participated in the study. A preexposure session was conducted in which *Ss* were exposed to written and pictorial depictions of rape and mutually-consenting intercourse. Based on *Ss*' penile tumescence to these depictions, they were classified as either Force-oriented, Nonforce-oriented or Unclassifiable. Subsequently, *Ss* were randomly assigned to sexually violent (SVS), sexually nonviolent (SNVS) or control conditions within each force-orientation group. Those assigned to the SVS condition were then exposed to 10 SVS including feature-length films and written and pictorial depictions over a period of 4 weeks. *Ss* in the SNVS condition were exposed to 10 similar media presentations depicting sexually nonviolent activities only. *Ss* in the control condition were not exposed to any stimuli during this 4-week period. Soon after completion of the exposure phase, *Ss* returned for a postexposure laboratory session in which they were presented with four depictions that were similar in theme to those in the preexposure session. Penile tumescence scores and self-reports of sexual arousal were obtained. Results revealed that, for Force-oriented *Ss*, those exposed to either SVS or SNVS were less aroused to the rape depictions in the postexposure session than those in the control condition. A similar pattern occurred with the nonrape depictions for these *Ss*, though it was considerably less pronounced. No evidence of a similar 'satiation' pattern was obtained for either Nonforce-oriented or Unclassifiable *Ss*, with these *Ss* showing no significant differences among the three exposure conditions. The findings are discussed in the context of cognitions, personality differences, conditioning processes, stimulus parameters and response habituation theories. Social and clinical implications are also discussed.

INTRODUCTION

With the proliferation of pornographic‡ magazines, books and films in the past 15 years, much public concern has been expressed over the potentially harmful effects of such materials. In 1967, the U.S. Congress, under "Public Law 90-100", found traffic in obscenity and pornography to be "a matter of national concern" (Report of the Commission on Obscenity and Pornography, 1970). Consequently, the Commission on Obscenity and Pornography (referred to simply as the COP hereafter) was established to investigate various concerns in this area, including the issue of the relationship between repeated exposure to pornography and sexual arousal. Of the COP studies, only Howard, Reifer and Liptzin (1970) addressed themselves directly to the aforementioned issue. They presented *Ss* with a potpourri of sexually nonviolent materials in 90-min sessions, 5 days a week, for 3 consecutive weeks. The same set of materials was employed during the first 2 weeks. In the third week, the original set was replaced by a new one. Physiological responses (i.e. penile tumescence and urinary acid phosphatase) to a postexposure erotic film revealed a satiation effect (i.e. diminished sexual arousal). Satiation was no longer found in response to an erotic film presented 2 months later.

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‡The terms pornography and erotica will be used interchangeably to refer to sexually explicit materials without any pejorative meaning necessarily intended.

In a more recent study, Schaefer and Colgan (1977) exposed 2 experimental and 6 control Ss to the same 6-page nonviolent erotic stimuli, followed by a novel 1-page sexually nonviolent passage in six sessions over a 2-week period. Immediately after each exposure, the experimental Ss masturbated where the controls did not. For the experimental Ss, results revealed a significant increase in penile tumescence across sessions for both same and novel erotic passages. For the control Ss, results showed a significant decrease in sexual responsiveness across sessions to the same stimulus while no differences were found for the novel stimuli. Although these results suggest that reinforcement (i.e. masturbation) may be a critical factor in exposure effects and that mere exposure may lead to satiation or no effect, various methodological (e.g. size of sample) and statistical limitations render the findings questionable.

In a very recent and important study, Zillmann and Bryant (1984) presented experimental Ss with six short hard-core films depicting nonviolent heterosexual activities in each of six consecutive weekly meetings (i.e. a total of 36 films). Control Ss were exposed to nonerotic films during the same period. Using heart rate and systolic blood pressure as measures of sexual arousal, Zillmann and Bryant reported a general decrease in arousal to hard-core and soft-core films depicting similar sex acts. No differences were obtained between the experimental and control groups with a film portraying sadomasochism and bestiality.

The above three studies, which surprisingly are the only ones to have specifically examined repeated exposure effects on arousal, suggest that mere exposure to sexually nonviolent stimuli may lead to satiation to such materials. However, what about the effects of exposures to sexually violent stimuli? Recent years have witnessed an increase of violent content in soft-core (Malamuth and Spinner, 1980) and hard-core (Dietz and Evans, 1982; Smith, 1976) pornography. Several writers have argued that exposures to such violent erotica affects both sexual responsiveness to and occurrence of sexually violent behaviors. For example, it has been argued that violence within erotica enhances sexual arousal to sexually violent fantasies (Gager and Shurr, 1976) and creates a "climate in which acts of sexual hostility directed against women are not only tolerated but ideologically encouraged" (Brownmiller, 1975, p. 444). Despite these expressed concerns, no known study has yet examined adequately repeated exposure effects with aggressively-toned pornography on sexual arousal.

There are a number of investigations that suggest that sexual arousal to sexual violence may be indicative of aggressive tendencies. Using rapists and nonrapists, Abel, Barlow, Blanchard and Guild (1977) found that the former were significantly more responsive to rape stimuli with their arousal levels similar to those for the mutually-consenting sex depictions. In contrast, the nonrapist group showed substantial sexual arousal to consenting sex depictions only. These investigators interpreted the 'excessive' arousal to rape themes by rapists as an index of 'proclivity to rape'. They suggested a classification scheme to obtain this index. More specifically, arousal to rape depictions which is ≥ 0.7 of arousal to consenting sex depictions would reflect a 'proclivity to rape', while a ratio of < 0.7 would suggest no such tendency. [See also Abel, Becker, Blanchard and Djenderedjan (1978)]. While other studies have provided support for Abel *et al.*'s (1977) conclusions (e.g. Quinsey and Chaplin, 1984), it has been shown that a substantial number of nonrapists are aroused to rape depictions, particularly those that portray the rape victim as becoming involuntarily aroused by the assault (Malamuth, Heim and Feshbach, 1980b; Malamuth and Check, 1980, 1983).

As indicated earlier, Zillmann and Bryant (1984) examined repeated-exposure effects on arousal to a postexposure sexually violent stimulus (i.e. sadomasochism). However, the materials employed during the exposure period were nonviolent. One study that did use more than one exposure to violent erotica was that of Malamuth, Haber and Feshbach (1980a). In this study, the experimenter first exposed college students to either a violent (i.e. sadomasochistic) or a nonviolent version of the same sexual passage. All Ss were subsequently exposed to a second passage portraying a rape scene. Self-reports revealed that males, who had been exposed to the violent version, tended (i.e. $P = 0.10$) to become more sexually aroused to the rape depiction than those who had earlier been exposed to the nonviolent version. These findings suggest that repeated exposure to sexually violent behaviors may enhance sexual responsiveness to such activities, though it would be incautious to arrive at a more definite conclusion with such limited exposure.

In addition to extending earlier research by assessing the effects of repeated exposure to sexually

violent pornography on sexual arousal, the present study goes beyond previous work in this area in examining the role of individual differences. In the area of media violence generally (Dorr and Kovarick, 1980) and aggressive erotica specifically (Malamuth and Check, 1981) it has been found that individuals with higher aggressive tendencies are more likely to be affected by exposure to violent media depictions than individuals with lower aggressive tendencies. While these studies assessed responses such as attitudes rather than arousal, there may also be important differences in the degree to which repeated exposure to sexually violent or nonviolent erotica affects Ss with differing degrees of aggressive tendencies. In the present study, the 'proclivity to rape' index developed by Abel *et al.* (1977) was the measure used to classify Ss along the individual differences dimension of aggressive tendencies.

In summary, the above discussion clearly demonstrates a paucity of studies employing sexually violent materials for examining exposure effects. Also, no study has yet investigated adequately repeated exposure effects using aggressively-toned pornography, with or without the 'proclivity to rape' factor suggested by Abel *et al.* (1977). Consequently, the present study was designed primarily to examine the effects of repetitive exposure to violent erotica on Ss' arousal to sexually violent stimuli. The effects were assessed on both Ss who prior to exposure showed relatively low sexual arousal and those showing relatively high sexual arousal to rape depictions.

METHOD

Overview of Design

The experimental design consisted of a 3(Force-orientation) \times 3(Exposure) randomized block design. On the basis of their tumescence responses to rape and nonrape depictions in a preexposure session, Ss were classified as either Force-oriented, Nonforce-oriented or Unclassifiable. Subsequently, within each force-orientation group, Ss were randomly assigned to one of three exposure conditions—sexually violent stimuli (SVS), sexually nonviolent stimuli (SNVS) or no exposure (control). Those assigned to the SVS condition were then exposed to six films and four take-home depictions consisting primarily of sexually violent activities over a period of 4 weeks. Those in the SNVS condition were exposed to similar media presentations of SNVS during the same period. Ss in the control condition were not exposed to any stimuli during the 4-week period. Soon after the exposures, Ss returned for a postexposure laboratory session in which they were presented with depictions that were similar in theme to those in the preexposure session.

The independent variables were Force-orientation and Exposure. The dependent variable was sexual arousal as measured by penile tumescence and self-reports. Arousal measures were obtained in both pre- and postexposure laboratory sessions.

Subjects

Twenty-six Ss were recruited from 51 respondents to a classified advertisement in the campus newspapers of the University of Manitoba and University of Winnipeg. The other respondents were not deemed suitable due to various reasons ranging from scheduling difficulties to questionable psychological stability. Since more Ss were required for the study, an additional 48 male volunteers were selected from the S pool at the University of Manitoba. All Ss completed the Minnesota Multiphasic Personality Inventory (MMPI) and a Sexual Background Questionnaire (SBQ) to ascertain that no one was severely psychologically impaired, that Ss had no legal difficulties and that they were not exclusively homosexuals. Four of the 26 ad respondents and 1 from the S pool dropped out at various stages of the study, leaving the final sample of 69 Ss.

Apparatus and Materials

Assessment of physiological arousal

Penile tumescence was measured throughout the exposures to the erotic stimuli in the pre- and postexposure sessions via a mercury-in-rubber strain gauge (Davis Inc., New York), a device recommended in recent analyses of various measuring instruments (Laws, 1977; Rosen and Keefe, 1978). In essence, this gauge is a fine-bore rubber band which is filled with mercury and encircles

the penis. With changes in penile diameter, the rubber band lengthens, causing a contraction of the mercury column. Changed resistance (related to erection) was monitored by a penile plethysmograph bridge, which allows the continuous reading of changes in penile diameter on a chart recorder.

Stimuli materials

Three written and three pictorial depictions were employed in a preexposure session. Each portrayal generally took about 2–3 min to read and review. The first written story described a woman masturbating. The second and third written stories portraying rape and nonrape, respectively, were those reported in Abel *et al.* (1977). The three pictorial stimuli, depicting nonrape, rape and lesbianism (taken from pornography magazines) followed in the order presented here. These stimuli had both pictures and accompanying narrative. Six different stories with similar themes to those of the preexposure session were used in the postexposure session. The postexposure second and third written stories portraying rape and nonrape, respectively, were from those presented in Abel *et al.* (1978). During the exposure period, 11 soft-core feature-length films, three chapters from various erotic books and four descriptive pictorials portraying a wide range of activities including heterosexual intercourse, group sex, lesbianism and sexual violence were employed.

Assessment questionnaires

The MMPI and a SBQ, based on those used by Fisher and Byrne (1978) and Goldstein, Kant and Hartman (1973), were administered to all *Ss* for screening purposes.

An 11-item Feelings Scale (FS; Byrne and Sheffield, 1965) was completed by all *Ss* immediately following each stimulus to assess their sexual arousal and affective reactions.

A Postexposure Questionnaire (PEQ), based on that used by Malamuth (1978), was administered to *Ss* at the end of the postexposure session to assess their awareness and hypotheses concerning the purpose of the experiment. No *S* was eliminated on the basis of this questionnaire.

A Debriefing Questionnaire (DQ), outlining the purpose of the study and inquiring about *Ss*' feelings concerning the experiment, was completed in the debriefing session.

General Release Form (GRF)

Each *S* was required to sign a GRF which outlined the purpose of the experiment and specified that he could withdraw from the study at any time without loss of credit for prior participation. The document also indicated that all information gathered throughout the study was to be kept confidential.

Procedure

The duration of the study was approx. 12 weeks. In the preexposure session, the *S* was first asked to sign the GRF. He was then led to a room containing a lounge chair, a small table with three bands of different sizes and a buzzer on it, and six envelopes containing the depictions and questionnaires. He was instructed on how to use the band and told not to touch the bands nor open the envelopes until instructed by the experimenter via the intercom system. Finally, he was told not to manipulate his penis while reading the stories because it would affect the recording of his penile response on the polygraph.

Once the experimenter was satisfied that the *S* understood the instructions, he went to the adjoining room which contained the plethysmograph. The *S* was then asked to try each of the three bands and to indicate which one fitted most comfortably. He was subsequently told to put on the band he found most comfortable and to sit back and relax until further instructions. The plethysmograph was immediately activated in order that a baseline be established.

As soon as the experimenter determined that a stable baseline had been attained (usually within 5 min), he instructed the *S* to open envelope No. 1, to read the story (written depiction of a woman masturbating), and to buzz the experimenter via the intercom when he was finished. When the *S* called he was told to complete the accompanying FS. Upon completion he was told to place the story and questionnaire back into the envelope and to sit back and relax until he was instructed

Table 1. Number of Ss in each cell as a function of force-orientation and exposure classifications

Exposure group	Force-orientation category		
	Force-oriented	Nonforce-oriented	Unclassifiable
SVS	11	8	6
SNVS	9	9	5
Control	8	8	5

to open the next envelope. The experimenter then waited for several minutes to allow the penis to return to the baseline level.

After the penis had remained at a baseline state for approx. 5 min, the S was instructed to open envelope No. 2, to read the story (written depiction of rape), to complete the FS and to wait until instructed to go on to story No. 3. The same procedure was followed for stories No. 3 (written depiction of mutually-consenting sex), No. 4 (descriptive pictorial of mutually-consenting sex), No. 5 (descriptive pictorial of rape), and No. 6 (descriptive pictorial of lesbianism). Depictions Nos 1 and 6 were included to reduce Ss' awareness of the study's focus on sexual violence. Following the completion of all six stories, the S was told to take off the band and that he would be contacted by phone regarding his next session.

On the basis of their tumescence scores to the rape-written and consenting-written depictions, Ss were classified along a Force-orientation dimension. More specifically, using Abel *et al.*'s (1977) classification scheme, Ss whose arousal level for the written rape portrayal was ≥ 0.7 of the arousal for the written mutually-consenting sex depiction were classified as Force-oriented ($n = 28$). Those with a comparative ratio < 0.7 were classified as Nonforce-oriented ($n = 25$).^{*} Those with scores < 2 cm (an arbitrarily selected value) on both stories were categorized as Unclassifiables ($n = 16$). Subsequently, within each force-orientation group, Ss were randomly assigned to one of three exposure conditions (SVS, SNVS, control). The resultant cell sizes are presented in Table 1.

Approximately 4 weeks after the preexposure session, experimental Ss in the SVS condition were exposed to six feature-length films portraying primarily sexually violent behaviors (e.g. sadomasochism and rape), two per week for 3 consecutive weeks. Immediately after each movie, Ss completed the FS. After the last film, Ss were given written and pictorial materials depicting sexually violent and nonviolent activities to take home for the fourth week of exposure. They were asked to complete the accompanying FS immediately after examining each of the four stories.

During this same 4-week exposure period Ss in the SNVS condition were presented with the same number and media stimuli as those in the SVS condition. The same questionnaires were also completed. The materials, however, depicted solely sexually nonviolent activities.

Control Ss were not exposed to any materials during the exposure period.

A few days following the exposure period, all Ss returned for a postexposure laboratory session. The procedure of this session was identical to that of the preexposure session. The order, theme and medium of the depictions were similar and the FS was completed after each story. At the end of the session Ss were asked to complete the PEQ.

Subsequently, Ss returned for a debriefing session. In this session, Ss completed a questionnaire tapping their feelings about the experiment (DQ). They were also given a handout outlining the purpose and procedure of the study and specifying that some types of pornographic materials may perpetuate myths regarding sexual violence. A group discussion concerning the details and purpose of the study ensued. Recent data by Donnerstein and Berkowitz (1981), Malamuth and Check (1984) and Check and Malamuth (1984) suggest that this type of debriefing procedure may be effective in counteracting possible undesirable effects of exposure to pornography, especially in reducing Ss' acceptance of rape myths.

^{*}Since the time the present study was initiated Abel and associates (e.g. Abel, Becker, Murphy and Flanagan, 1981) have modified this ratio to that of 1.00 as the discriminating criterion. However, it would not seem likely that the present study's findings regarding the effects of repeated exposure to pornography on men's sexual arousal levels would have been substantially altered had a 'rape index' of 1.00 been used instead of the 0.7 ratio.

RESULTS

Random Assignment Verification

In order to verify the success of random assignment to the different exposure conditions, separate two-way multivariate analyses of variance (MANOVAs) with Force-orientation (Force-oriented, Nonforce-oriented, Unclassifiable) and Exposure (SVS, SNVS, control) as the independent variables were performed on the preexposure tumescence and self-reported arousal scores of each of the four depictions (rape-written, consenting-written, consenting-pictorial, rape-pictorial).^{*} In both analyses, results revealed significance for the Force-orientation factor. However, this is not surprising since this variable was the blocking factor used to classify *S*s in their respective groups. As expected, no main effects for Exposure were obtained in either case. While the multivariate interaction factor did not achieve significance in the tumescence analysis, it approached significance in the self-reported analysis [$F(16, 175) = 1.66, P < 0.058$]. Examination of the univariate interactions revealed an effect that approached significance in the tumescence analysis [$F(4, 60) = 2.50, P < 0.052$] and one that achieved significance in the self-reported analysis [$F(4, 60) = 6.65, P < 0.002$] for the rape-descriptive pictorial. No other effects were obtained.

Follow-up tests of simple main effects (Keppel, 1973) showed effects for the Nonforce-oriented *S*s only: an effect that approached significance for the tumescence data [$F(2, 60) = 2.95, P < 0.08$] and a significant effect [$F(2, 60) = 8.06, P < 0.001$] for the self-reported data. Follow-up comparisons (Winer, 1971) on the tumescence scores among the Nonforce-oriented *S*s revealed differences that approached significance between those in the SVS condition ($\bar{X} = 9.03$) and the controls ($\bar{X} = 4.73$) [$F(1, 60) = 4.63, P < 0.05\ddagger$] and between those in the SNVS condition ($\bar{X} = 9.31$) and the controls [$F(1, 60) = 5.48, P < 0.025$]. No significant differences were found between the two experimental groups. For the self-reported data, comparisons revealed that Nonforce-oriented *S*s in the SNVS condition ($\bar{X} = 4.00$) were significantly more aroused than the controls ($\bar{X} = 2.13$) [$F(1, 60) = 13.40, P < 0.017$]. Also, an effect that approached significance was obtained between *S*s in the SVS condition ($\bar{X} = 3.13$) and the controls [$F(1, 60) = 5.0, P < 0.043$] and between the two experimental groups [$F(1, 60) = 3.90, P < 0.055$].

In light of the relatively numerous statistical results that were examined to verify random assignment, some significant effects may occur by chance (Keppel, 1973). Thus, the relatively few significant preexposure differences that did occur are not reason to cause grave concern regarding the interpretation of the postexposure data. Also, since random assignment to the three exposure conditions was done separately for each of the force-orientation groups, it would be more important that the Exposure factor show no effects, as indeed was the case.

On the basis of the above argument, it would seem reasonable to conclude that random assignment was successful, though it still would be advisable to exercise caution in the interpretation of postexposure scores for those *S*s who showed some initial differences (i.e. Nonforce-oriented *S*s). Furthermore, to satisfy the more critical reader and to provide a more stringent statistical analysis of the data, *S*s' responses were analyzed in three steps. First, a MANOVA is presented to provide a general overview of the data. Second, an analysis of covariance (ANCOVA) for each of the four depictions is conducted. Third, follow-up comparisons are performed using the adjusted means rather than the raw scores.

Exposure Effects on Postexposure Tumescence Responses

A 3(Force-orientation) \times 3(Exposure) MANOVA on the postexposure tumescence scores of the four depictions revealed significant main effects for the Force-orientation factor [$F(8, 114) = 4.15, P < 0.004$]. Univariate analyses revealed significant effects for all variables, except for the consenting-pictorial, which approached significance ($P < 0.08$). These results simply reflect consistency of *S*s' force-orientation across time. A significant multivariate effect was also obtained for the Exposure factor [$F(18, 114) = 2.04, P < 0.048$]. Univariate analyses, however, revealed no

^{*}The two stories depicting a woman masturbating or lesbianism were not included in the analyses since their purpose was to help disguise the purpose of the study.

[†]Since throughout the study three separate comparisons are to be conducted within each force-orientation category, the error rate was adjusted to 0.017 (i.e. 0.05/3). The conventional error rate of 0.05 was used for omnibus *F*-tests.

Table 2. Adjusted and unadjusted (in parentheses) means of postexposure tumescence scores (in cm) for the four depictions as a function of force-orientation and exposure classifications

Depiction	Exposure group	Force-orientation category		
		Force-oriented	Nonforce-oriented	Unclassifiable
Rape-written	SVS	1.85 (4.50)	4.20 (2.43)	4.10 (1.52)
	SNVS	0.88 (3.39)	6.10 (5.79)	4.21 (1.36)
	Control	4.49 (8.16)	4.20 (1.66)	4.43 (1.62)
Consenting-written	SVS	4.23 (4.58)	6.77 (8.24)	3.49 (1.28)
	SNVS	2.88 (2.89)	3.42 (4.63)	2.74 (0.52)
	Control	6.54 (7.43)	3.08 (3.31)	4.18 (1.92)
Consenting-pictorial	SVS	7.80 (8.04)	9.02 (10.15)	7.98 (5.85)
	SNVS	4.05 (4.81)	10.14 (10.93)	5.01 (4.30)
	Control	10.05 (10.53)	7.27 (6.79)	8.90 (7.06)
Rape-pictorial	SVS	6.46 (7.16)	5.91 (6.54)	6.11 (4.13)
	SNVS	4.43 (4.87)	9.66 (10.42)	3.90 (2.14)
	Control	8.74 (10.75)	6.66 (5.18)	8.77 (7.34)

significant Exposure effect for any of the four depictions. The multivariate interaction achieved significance [$F(16, 175) = 2.29, P < 0.005$]. Univariate analyses for the interaction factor yielded significance for both rape-written [$F(4, 60) = 3.44, P < 0.014$] and rape-pictorial [$F(4, 60) = 4.72, P < 0.002$] and an effect that was close to significance for the consenting-written [$F(4, 60) = 2.49, P < 0.052$] and the consenting-pictorial [$F(4, 60) = 2.43, P < 0.057$]. The direction of the differences among the various groups for each story are discussed in the ANCOVAs below and presented in Table 2.

The above findings indicate that Force-orientation and Exposure factors interacted in influencing sexual arousal. However, in light of the preexposure differences obtained with the Nonforce-oriented Ss, interpretation of the above results for these Ss may be open to question. Consequently, as indicated earlier, ANCOVAs and comparisons on the adjusted means of each of the four depictions were conducted.

(A) Rape-written

ANCOVA showed no Exposure effect for the rape-written story.* There was, however, an interaction effect that was close to significance [$F(4, 59) = 2.42, P < 0.059$]. Planned comparisons on the adjusted means of the Force-oriented Ss (see Table 2) revealed that the difference between SVS Ss ($\bar{X} = 1.85$) and the controls ($\bar{X} = 4.49$) was close to significance [$F(1, 59) = 3.82, P < 0.056$]. Ss in the SNVS condition ($\bar{X} = 0.88$) also showed less arousal than the controls, and this difference did achieve significance [$F(1, 59) = 7.11, P < 0.017$]. No significant difference was obtained between the two experimental groups. From these results it seems that, for Force-oriented Ss, repeated exposure to SVS or SNVS may lead to a satiation effect to subsequent rape stimuli.

For both Nonforce-oriented and Unclassifiable Ss, comparisons on the adjusted means of the various exposure groups (see Table 2) revealed no significant differences. These findings suggest that for such individuals repeated exposure to SVS or SNVS had no effect on subsequent arousal to rape depictions.

(B) Rape-pictorial

A two-way ANCOVA showed no Exposure effect for the rape-pictorial. The interaction factor, however, achieved significance [$F(4, 59) = 3.02, P < 0.025$]. Planned comparisons on the adjusted means of the Force-oriented Ss (see Table 2) showed no significant difference between those in the SVS condition ($\bar{X} = 6.46$) and the controls ($\bar{X} = 8.74$) and a difference that approached significance between Ss in the SNVS condition ($\bar{X} = 4.43$) and the controls [$F(1, 59) = 4.96, P < 0.03$]. It is interesting to note however, that the direction of these differences is consistent with the one obtained in the rape-written analysis. Also, similar to the rape-written story, the difference between

*The reason why the result of the Force-orientation factor in the ANCOVA is not reported here, as well as throughout this paper, is that Ss were classified in terms of their force-orientation on the basis of their scores in the preexposure session. It was therefore expected that there would be differences across force-orientation groups and, consequently, adjustments of their raw scores by the ANCOVA procedure is meaningless (Pedhazur, 1982).

the two experimental groups was not significant. These results provide additional evidence that, for Force-oriented Ss, repeated exposure to SVS or SNVS may lead to a satiation effect.

For the Nonforce-oriented and Unclassifiable Ss, planned comparisons on the adjusted means (see Table 2) showed generally no significant differences. Significance was achieved only between Unclassifiable Ss in the SNVS condition ($\bar{X} = 3.90$) and the controls ($\bar{X} = 8.77$) [$F(1, 59) = 6.58$, $P < 0.017$]. Since this has been the only difference thus far to achieve significance among Unclassifiables, the extent to which it is reliable will be discussed below pending examination of the self-report data of the rape depictions. Overall, however, these results suggest that, for Nonforce-oriented and Unclassifiable Ss, repeated exposure to SVS or SNVS had no effect on arousal to rape stimuli.

(C) *Consenting-written*

A two-way ANCOVA on the consenting-written story revealed no significant effects for the Exposure variable nor an interaction effect. In other words, adjusted mean differences among the exposure groups within each force-orientation group (see Table 2) did not achieve significance. These findings suggest that repeated exposure to SVS or SNVS, irrespective of force-orientation, has no effect on subsequent arousal to SNVS stimuli (i.e. mutually-consenting intercourse). It is interesting to note, however, that the pattern of the scores of Ss exposed to SVS, SNVS or no stimuli within the Force-oriented group is consistent with the pattern obtained with the two rape depictions.

(D) *Consenting-pictorial*

A two-way ANCOVA revealed no Exposure effect for the consenting-pictorial. There was, however, an interaction that approached significance [$F(2, 59) = 2.36$, $P < 0.064$]. Comparisons on the adjusted means of the exposure conditions within the Force-oriented group (see Table 2) revealed significant differences only between Ss exposed to SNVS ($\bar{X} = 4.05$) and the controls ($\bar{X} = 10.05$) [$F(1, 59) = 6.79$, $P < 0.017$], the direction being consistent with that of the other three depictions. Although Ss exposed to SVS ($\bar{X} = 7.80$) did not differ significantly from the controls, it should be noted that the difference for Force-oriented Ss is in the same direction as in the other three depictions.

For both Nonforce-oriented and Unclassifiable Ss, comparisons on the adjusted means of the various exposure groups (see Table 2) yielded no significant differences. These findings are consistent with the results of the other three depictions, suggesting that for such individuals repeated exposure to SVS or SNVS had no effect on arousal to nonviolent erotica.

Exposure Effects on Postexposure Self-reported Arousal

A 3(Force-orientation) \times 3(Exposure) MANOVA on the postexposure self-reported arousal of the four depictions revealed significance for the Force-orientation factor [$F(8, 114) = 3.10$, $P < 0.004$]. Univariate analyses showed significance for the consenting portrayals and effects that approached significance ($P < 0.10$) for the rape depictions. These data reflect consistency of Ss' force-orientation across time. The Exposure factor approached significance at the multivariate level [$F(8, 114) = 1.77$, $P < 0.0894$]. Univariate analyses yielded a significant Exposure effect for the rape-pictorial [$F(2, 60) = 4.93$, $P < 0.01$] and an effect that approached significance for the consenting-pictorial [$F(2, 60) = 2.82$, $P < 0.068$]. Marginal means of the exposure conditions of these two pictorials showed a pattern similar to that obtained with Force-oriented Ss in the tumescence analysis. That is, for the rape-pictorial, Ss exposed to SVS ($\bar{X} = 2.28$) or SNVS ($\bar{X} = 2.74$) were less aroused than the controls ($\bar{X} = 3.14$). For the consenting-pictorial, Ss presented with SVS ($\bar{X} = 3.00$) or SNVS ($\bar{X} = 3.30$) were also less aroused than the controls ($\bar{X} = 3.62$).

No multivariate interaction effect was obtained. Univariate analyses revealed only an interaction effect that approached significance for the consenting-pictorial [$F(4, 60) = 2.13$, $P < 0.088$]. Direction of the differences among the various groups for this story is presented in the ANCOVA below.

The above findings are not fully consistent with the results obtained when tumescence was used as the dependent variable. However, for the reasons outlined earlier, the MANOVA was conducted only to provide an overview of the data. ANCOVAs and planned comparisons based on the

Table 3. Adjusted and unadjusted (in parentheses) means of postexposure self-reported arousal for the four depictions as a function of force-orientation and exposure classifications (on a scale of 1-5)

Depiction	Exposure group	Force-orientation category		
		Force-oriented	Nonforce-oriented	Unclassifiable
Rape-written	SVS	1.77 (2.18)	1.69 (1.38)	1.73 (1.50)
	SNVS	1.55 (1.89)	2.34 (2.22)	1.56 (1.40)
	Control	1.92 (2.25)	2.01 (1.63)	2.27 (2.00)
Consenting-written	SVS	2.43 (2.45)	3.03 (3.13)	1.93 (1.50)
	SNVS	2.26 (2.22)	2.29 (2.56)	1.75 (1.60)
	Control	2.41 (2.50)	2.41 (2.50)	2.42 (2.20)
Consenting-pictorial	SVS	3.18 (3.27)	3.28 (3.13)	2.50 (2.33)
	SNVS	2.75 (2.78)	3.93 (4.11)	2.67 (2.80)
	Control	3.86 (3.88)	3.84 (3.75)	3.14 (3.00)
Rape-pictorial	SVS	2.41 (2.64)	2.21 (2.13)	2.02 (1.83)
	SNVS	2.76 (2.67)	2.78 (3.00)	2.53 (2.40)
	Control	3.53 (3.75)	3.06 (2.63)	2.92 (3.00)

adjusted means were also performed with the self-report data and any discrepancies that occurred between the two analyses are discussed below.

(A) Rape-written

A two-way ANCOVA on the reported arousal to the rape-written story yielded no significant effects for the Exposure variable nor an interaction factor for the rape-written story. Thus, within each force-orientation category, the adjusted means of *Ss* exposed to SVS, SNVS, and no stimuli (see Table 3) did not differ significantly from each other. Although the differences among the Force-oriented *Ss* did not achieve significance (while they did with the tumescence analysis), it should be noted that the mean differences were in the same direction.

(B) Rape-pictorial

A two-way ANCOVA revealed a significant Exposure effect [$F(2, 59) = 5.69, P < 0.006$] and no interaction effect for the rape-pictorial. Since the lower adjusted marginal means of *Ss* exposed to SVS ($\bar{X} = 2.28$) or SNVS ($\bar{X} = 2.74$) relative to the controls ($\bar{X} = 3.14$) are consistent with the emerging pattern for the Force-oriented *Ss*, comparisons on the adjusted means of the various exposure groups within each force-orientation category were conducted for exploratory purposes. Among the Force-oriented *Ss* an effect that approached significance was obtained between *Ss* exposed to SVS ($\bar{X} = 2.41$) and the controls ($\bar{X} = 3.53$) [$F(1, 59) = 5.15, P < 0.03$]. This finding is consistent with the general pattern of the tumescence data that, for Force-oriented *Ss*, repeated exposure to SVS may lead to a satiation effect. Although the difference between *Ss* exposed to SNVS ($\bar{X} = 2.76$) and the controls did not achieve significance, the direction of the difference was also consistent with the satiation pattern.

For Nonforce-oriented *Ss*, comparisons among the adjusted means of the different exposure conditions showed no significant differences. These findings are consistent with those in the tumescence analysis and they further suggest that, for Nonforce-oriented *Ss*, repeated exposure to SVS or SNVS had no effect on arousal to rape stimuli.

For Unclassifiable *Ss*, comparisons on the adjusted means also showed no significant differences. The reader will recall that *Ss* exposed to SNVS and controls differed significantly in the tumescence analysis. However, since all other comparisons among Unclassifiables for the rape depiction in both tumescence and self-report analyses consistently showed no significant differences, it may be that for such individuals exposure to SVS or SNVS has no effect on arousal to rape stimuli. Nonetheless, it is advisable to exercise caution in the interpretation of the results of Unclassifiable *Ss*.

(C) Consenting-written

A two-way ANCOVA on self-reported arousal to the consenting-written story revealed no significant effect for the Exposure variable nor an interaction effect. Thus, differences among the exposure groups within each force-orientation category (see Table 3) were not significant. These findings are consistent with those obtained with the tumescence data and they provide further

testimony that, irrespective of force-orientation, repeated exposure to SVS or SNVS had no effect on arousal to mutually-consenting sex stimuli.

(D) *Consenting-pictorial*

A two-way ANCOVA revealed a significant Exposure effect [$F(2, 59) = 3.68, P < 0.031$] but no interaction effect. Since the lower marginal means of Ss exposed to SVS ($\bar{X} = 3.00$) or SNVS ($\bar{X} = 3.30$) relative to the controls ($\bar{X} = 3.62$) are consistent with the overall pattern for the Force-oriented Ss, comparisons of the adjusted means of the various exposure groups within each force-orientation category (see Table 3) were conducted for exploratory purposes.

Among the Force-oriented Ss, those exposed to SNVS ($\bar{X} = 2.75$) showed significantly less arousal than the controls ($\bar{X} = 3.86$) [$F(1, 59) = 7.08, P < 0.017$]. The direction of this difference is consistent with the general finding of a satiation effect for the Force-oriented group. Although the difference between Ss exposed to SVS ($\bar{X} = 3.18$) and the controls was not significant, it is also in the same direction and consistent with this general finding.

For the Nonforce-oriented and Unclassifiable Ss, none of the differences among the exposure groups achieved significance. These findings are consistent with the emerging pattern that for such individuals repeated exposure to SVS or SNVS had no effect on arousal to mutually-consenting sex depictions.

DISCUSSION

The pattern of the data clearly suggest that repeated exposure to sexually violent or nonviolent pornography resulted in satiation in sexual arousal to rape themes for Force-oriented Ss (i.e. those who prior to any exposure had shown relatively high levels of arousal to rape stimuli). In contrast, no effects were obtained for the Nonforce-oriented and Unclassifiable Ss. Results also revealed that, irrespective of force-orientation, exposure to SVS or SNVS had no significant effect on arousal to mutually-consenting sex stimuli. However, it should be noted that the direction of the differences among the Force-oriented Ss was suggestive of satiation of those exposed to either SVS or SNVS. At this point the reader is reminded that, while random assignment was successful with Force-oriented and Unclassifiable Ss, there was some question of its success with Nonforce-oriented Ss. Consequently, caution must be exercised in the interpretation of the results of the Nonforce-oriented group.

While one might interpret the satiation effect of Force-oriented Ss and the no-effect findings of the other force-orientation groups as supportive of the position that pornography has no harmful effects, this interpretation might be misleading in light of other research on repeated exposure effects. For example, Zillmann and Bryant (1984) found that repeated exposure to 'heavy doses' of pornography led not only to satiation in arousal but to a reduction in repulsion to varied 'deviant' stimuli, to greater callousness towards women and more leniency in sentencing rapists in simulated rape trials.

The present results may have some clinical implications for the treatment of sexual aggression. The preexposure arousal pattern of the Force-oriented Ss was analogous to that of the rapists employed in various studies (e.g. Abel *et al.*, 1977). These data suggest the need for some caution in using the 'rape index' alone as a measure of tendencies to actually engage in sexually violent acts. Since the present data suggest that within the general population there are a substantial number of people who show considerable arousal to the type of rape portrayals used to identify rapists (e.g. Abel *et al.*, 1977, 1978), the arousal data should only be used in conjunction with other measures as a possible predictor of aggressive tendencies. Thus, at this time it appears that the findings in the study by Abel *et al.* (1978) that "... a rape index of 0.70 or greater indicates that those in this category have a very high likelihood of being rapists" (p. 327), should be treated with caution. Nonetheless, it does appear that for men from the general population the 'rape index' is a significant predictor of aggressive tendencies, such as aggression against women in a laboratory setting (Malamuth, 1983), although this tendency may not actually be manifested in violent acts such as rape.

One may argue that the satiation effect found for Force-oriented Ss suggests that 'heavy dosages' of repeated exposure to rape stimuli may be one ingredient in clinical efforts to reduce sexual

arousal to rape. Indeed, some therapeutic attempts have been made along these lines in what has been labeled 'satiation therapy' (e.g. Marshall, 1979; Marshall and Barbaree, 1978; Marshall and Lippens, 1977). However, mere repetitive exposure to SVS is not likely to permanently alter arousal patterns, let alone actual behavior. There clearly are other factors which need to be considered in conjunction with repetitive exposure in treating sexual aggression (Marshall, 1979; Marshall and Barbaree, 1978).

While no theory known to the authors can fully account for the pattern of results found, there are several potentially relevant variables which need to be considered in order to begin to understand the results of the present study and the nature of exposure effects in general. These variables include cognitions, personality differences, conditioning processes and stimulus parameters.

Cognitions

Although it has been demonstrated that cognition can either hinder or facilitate the human sexual response (Geer and Fuhr, 1976; Heiman, 1975), there is no known theoretical framework which specifically considers cognitive differences and how they relate to effects of exposure to pornography. One potentially relevant theory, however, is the Stimulus Comparative Model proposed by Sokolov (1963a, b, 1969). This theory was designed to account for the elicitation and habituation of the Orienting Reflex (OR), which Sokolov defined as a generalized system of responses encompassing autonomic, somatic and sensory components. Since sexual responses are directly regulated by the autonomic nervous system (Eysenck and Nias, 1978), they are autonomic responses and therefore fall under the rubric of ORs.

According to this model, exposure to a specific stimulus generates a neuronal model in the cerebral cortex encompassing the various parameters of that stimulus. With subsequent exposures to identical stimuli, the OR gradually habituates. However, if the neuronal model and subsequent stimulus differ, the OR is elicited, its strength being dependent on the degree of similarity between the two. More specifically, the greater the difference, the larger the OR. In Sokolov's words, "after repeated presentation of stimuli with characteristics varying within given limits, the neuronal model is generalized to match the limits of stimulus variation." (1963a, p. 562). This statement seems to imply that exposure to similar stimuli may result in a generalized stimulus model to which habituation may occur. If this is true, then response strength may be a function of the degree of similarity between the generalized stimulus model and a subsequent stimulus. The reader may notice that this relationship is equivalent to the one reflected in the concept of stimulus generalization gradient as found in learning theory (e.g. Millenson and Leslie, 1979).

Applying the above concepts to pornography, it may be that repetitive exposure to variations of a theme (e.g. rape, group sex) might lead to habituation to that class of activities. Furthermore, since erotica has the sexual element as a common denominator, exposures to one theme may also affect arousal to related ones, the effect depending on the similarity between the stimuli. On the basis of this reasoning, it can be argued that rape and sadomasochism are related along certain dimensions (e.g. both involve violence) and therefore it would be expected that *Ss* who were exposed to SVS (i.e. rape and sadomasochism) in the present study would show less arousal to postexposure rape stimuli than the controls. Similarly, diverse nonviolent erotica may be related in terms of some theme (e.g. mutually-consenting activities) and, therefore, exposures to such stimuli may lead to satiation of similar material. Also, it can be argued that rape and consenting sex are related (e.g. nudity of adult males and females). Consequently, it would be expected that the *Ss* exposed to SVS or SNVS would show less arousal than the controls to consenting sex or rape depictions, respectively. However, only Force-oriented *Ss* showed a satiation pattern that was somewhat consistent with expectations. Even here, however, a greater degree of correspondence might have been expected between the type of stimuli used in the exposure phase (e.g. SVS) and satiation to similar stimuli (e.g. rape).

Thus, while Sokolov's theory may be of some help in explaining the results of Force-oriented *Ss*, it fails to account for the null effect exhibited by Nonforce-oriented and Unclassifiable *Ss* for both rape and nonrape depictions. Consequently, it is highly probable that this theory, which emphasizes the memory component of cognition, may be too limited in scope for studying exposure

effects. There may be additional cognitive elements and other dimensions such as personality differences and conditioning processes which play some role in exposure effects.

Personality factors

One theory that addresses itself to personality differences and their relationship to exposure effects is Eysenck's General Theory of Personality (Eysenck, 1967). This theory describes personality in terms of three major dimensions—Neuroticism, Psychoticism and Extraversion. Of these dimensions, Extraversion has received the most attention in terms of its role in mediating effects of exposure to erotica. According to this theory, extraverts have low cortical arousal while introverts have high levels of cortical arousal. Because of this difference, extraverts require and seek greater external stimulation (e.g. highly-arousing stimuli such as pornography) to achieve a satisfying level of arousal, condition less quickly and extinguish faster than introverts. In a modification of the conditioning component, Gray (1970, 1972) suggested that extraverts condition quicker to stimuli associated with reinforcement. Introverts, on the other hand, condition better to stimuli associated with guilt, anxiety, frustrative nonreward and/or punishment.

On the basis of the above theory, Eysenck and Nias (1978) predicted differential exposure effects for extraverts and introverts. More specifically, extraverts are expected to habituate more quickly with repeated exposure to sexual stimuli, and condition more rapidly to stimuli paired with stimulating and sexually-exciting events (e.g. orgasm). In contrast, introverts are expected not to habituate as readily, but condition more quickly to erotica which elicits negative emotional reactions.

The present study was not designed to manipulate the Extraversion-Introversion variable. Consequently, *Ss* are probably not normally distributed along this dimension. Nonetheless, Eysenck's theory provides an illustration of a model that could potentially account for the pattern of the data of the present study. The fact that the Force-oriented *Ss* were initially more responsive to the rape stimuli than others and satiated to them (whereas other *Ss* did not) is analogous to the model about the effects with extraverts. Consequently, it seems important that future research test for mechanisms underlying these initial arousal differences and their relationship to satiation.

Conditioning processes

Conditioning and other learning mechanisms may play an important role in mediating the effects of exposure to erotica (Rachman, 1966; Rachman and Hodgson, 1968), particularly at certain critical stages of development such as during adolescence. In delineating differential patterns of conditioning in extraverts and introverts, Eysenck and Nias (1978) and Gray (1972) alluded to what may be a very critical element in exposure effects, i.e. contingencies—reward, punishment or frustrative nonreward. It may be that such contingencies are of considerable importance during exposure to erotica. As noted earlier, Schaefer and Colgan (1977) found that exposure *per se* to SNVS led to an overall satiation effect while enhancement of tumescence responses occurred when exposure was followed immediately and repeatedly by positive reinforcement (i.e. masturbation). Although the stimuli employed were sexually nonviolent, the results point to the potential role of conditioning during exposure, whether it be with aggressive or nonaggressive pornography.

Obviously, there are ethical and practical concerns which limit the use of systematic conditioning procedures in order to determine whether sexually violent or similar responses may be conditioned within a research context. Nonetheless, the issue of repeated-exposure effects may be of sufficient importance to warrant some attempts to address this area of concern.

Stimulus parameters

Research investigating the phenomenon of habituation of human physiological responses (i.e. electrodermal, cardiovascular and electroencephalographic systems), following repeated exposure to various stimuli such as sound, light and electrical and thermal stimulation, has found stimulus intensity and interstimulus interval (i.e. interval between stimulus exposure) to be particularly important (Graham, 1973; O'Gorman, 1977). Stimulus intensity effect was found to depend on the response system studied and the measure of habituation employed, although interstimulus interval (ISI) was found to be generally inversely related to the rate of habituation.

Whether the above relationships hold in the context of exposure effects to pornography remains

to be seen. The complexity of pornographic stimuli and the human sexual response may be greater than the stimuli and response systems mentioned above. Nevertheless, these two stimulus variables may be relevant, especially ISI.

To date, studies which examined effects of repeated exposure to pornography (including the present one) employed ISIs ranging from a single day to a week. But are these intervals comparable to those in Ss' natural environment? It is likely that the 'average' person experiences occasional exposures at varying intervals. With such exposure, one is unlikely to reach a point at which habituation (particularly long-term) may occur. If occasional exposure is indeed the 'typical' real-life 'dosage level', then the ISIs employed by studies on repeated-exposure effects may be relatively short. This difference between ISIs employed in studies and those in the natural setting may therefore help account for the inconsistencies between the general finding of satiation and the continued high rate of pornographic consumption (Target Group Index, 1978).

On the basis of the above reasoning, it may be suggested that satiation to pornography and ISI are inversely related, the direction being similar to the one reported by Graham (1973) and O'Gorman (1977). To shed some light on this potentially critical relationship, future research needs to employ ISIs which approximate the naturalistic setting as much as possible.

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REFERENCES

- Abel G. G. and Blanchard E. B. (1976) The measurement and generation of sexual arousal in male sexual deviates. In *Progress in Behavior Modification*, Vol. 2 (Edited by Hersen M., Eisler R. M. and Miller P. M.). Academic Press, New York.
- Abel G. G., Barlow D. H., Blanchard E. B. and Guild D. (1977) The components of rapists' sexual arousal. *Archs gen. Psychiat.* 34, 895-903.
- Abel G. G., Becker J. V., Blanchard E. B. and Djenderedjan A. (1978) Differentiating sexual aggressives with penile measures. *Crim. Justice Behav.* 5, 315-332.
- Abel G. G., Becker J. V., Murphy W. D. and Flanagan B. (1981) Identifying dangerous child molesters. In *Violent Behavior: Social Learning Approaches to Prediction, Management and Treatment* (Edited by Stuart R. B.), pp. 116-137. Brunner/Mazel, New York.
- Bridgell D., Rimm D., Caddy G., Drawitz G., Sholis D. and Wunderlin R. (1978) Effects of alcohol and cognitive set on sexual arousal to deviant stimuli. *J. abnorm. Psychol.* 87, 418-430.
- Brownmiller S. (1975) *Against our Will: Men, Women, and Rape*. Simon & Schuster, New York.
- Byrne D. and Sheffield J. (1965) Responses to sexually arousing stimuli as a function of repressing and sensitizing defenses. *J. abnorm. Psychol.* 70, 114-118.
- Check J. V. P. and Malamuth N. M. (1984) Can participation in pornography experiments have positive effects? *J. Sex Res.* 20, 14-31.
- Dietz P. E. and Evans B. (1982) Pornographic imagery and prevalence of paraphilia. *Am. J. Psychiat.* 139, 1493-1495.
- Donnerstein E. and Berkowitz L. (1981) Victim reactions in aggressive-erotic films as a factor in violence against women. *J. Person. soc. Psychol.* 41, 710-724.
- Dorr A. and Kovarick P. (1980) Some of the people some of the time—but which people? In *Children and the Faces of Television* (Edited by Palmer E. L. and Dorr A.). Academic Press, New York.
- Eysenck H. J. (1969) *The Biological Basis of Personality*. Thomas, Springfield, Ill.
- Eysenck H. J. and Nias D. K. B. (1978) *Sex, Violence, and the Media*. St Martin's Press, New York.
- Fisher W. A. and Byrne D. (1978) Individual differences in affective, evaluative, and behavioral responses to an erotic film. *J. appl. soc. Psychol.* 8, 355-365.
- Gager N. and Schurr C. (1976) *Sexual Assault: Confronting Rape in America*. Grosset & Dunlop, New York.
- Geer J. H. and Fuhr R. (1976) Cognitive factors in sexual arousal: the role of distraction. *J. consult. Clin. Psychol.* 44, 238-243.
- Goldstein M. J., Kant H. S. and Hartmann J. J. (1973) *Pornography and Sexual Deviance*. Univ. of California Press, Los Angeles, Calif.
- Graham F. K. (1973) Habituation and dishabituation of responses innervated by the autonomic nervous system. In *Habituation* (Edited by Peeke V. S. and Herz M. J.). Academic Press, New York.
- Gray J. A. (1970) The psychophysiological basis of introversion-extraversion. *Behav. Res. Ther.* 8, 249-266.
- Gray J. A. (1972) The psychophysiological nature of introversion-extraversion: a modification of Eysenck's theory. In *Biological Basis of Individual Behavior* (Edited by Nebylitsyn V. D. and Gray J. A.). Academic Press, New York.
- Heiman J. A. (1975) Use of the vaginal photoplethysmograph as a diagnostic and treatment aid in female sexual dysfunction. Paper delivered at the 83rd Annual Convention of the American Psychological Association, Chicago, Ill.
- Howard J. L., Reifler C. B. and Liptzin M. B. (1970) Effects of exposure to pornography. *Technical Reports of the Commission on Obscenity and Pornography*, Vol. 8. U.S. Government Printing Office, Washington, D.C.
- Keppel G. (1973) *Design and Analysis: A Researcher's Handbook*. Prentice-Hall, Englewood Cliffs, N.J.
- Kercher G. A. and Walker C. E. (1973) Reactions of convicted rapists to sexually explicit stimuli. *J. abnorm. Psychol.* 81, 46-50.
- Laws D. R. (1977) A comparison of the measurement characteristics of two circumferential penile transducers. *Archs sex. Behav.* 6, 45-51.

- Malamuth N. M. (1978) Erotica, aggression, and perceived appropriateness. Paper presented at the 86th Annual Convention of the American Psychological Association, Toronto, Canada.
- Malamuth N. M. (1981) Rape fantasies as a function of exposure to violent-sexual stimuli. *Archs sex. Behav.* 10, 33-47.
- Malamuth N. M. (1983) Factors associated with rape as predictors of laboratory aggression against women. *J. Person. soc. Psychol.* 45, 432-442.
- Malamuth N. M. and Check J. V. P. (1980) Penile tumescence and perceptual responses to rape as a function of victim's perceived responses. *J. appl. soc. Psychol.* 10, 20-47.
- Malamuth N. M. and Check J. V. P. (1981) Aggressive-pornography and beliefs in rape myths: individual differences. Paper presented at the 89th Annual Convention of the American Psychological Association, Los Angeles, Calif.
- Malamuth N. M. and Check J. V. P. (1983) Sexual arousal to rape depictions: individual differences. *J. abnorm. Psychol.* 92, 55-67.
- Malamuth N. M. and Check J. V. P. (1984) Debriefing effectiveness following exposure to pornographic rape depictions. *J. Sex Res.* 20, 1-13.
- Malamuth N. M. and Spinner B. (1980) A longitudinal content analysis of sexual violence in the best-selling erotic magazines. *J. Sex Res.* 16, 226-237.
- Malamuth N. M., Haber S. and Feshbach S. (1980a) Testing hypotheses regarding rape: exposure to sexual violence, sex differences, and the "normality" of rapists. *J. Res. Person.* 14, 127-137.
- Malamuth N. M., Heim M. and Feshbach S. (1980b) The sexual responsiveness of college students to rape depictions: inhibitory and disinhibitory effects. *J. Person. soc. Psychol.* 30, 399-408.
- Marshall W. L. (1979) Satiation therapy: a procedure for reducing deviant sexual arousal. *J. appl. Behav. Analysis* 12, 377-389.
- Marshall W. L. and Barbaree H. E. (1978) The reduction of deviant arousal: satiation treatment for sexual aggressors. *Crim. Justice Behav.* 5, 294-303.
- Marshall W. L. and Lippens B. A. (1977) The clinical value of boredom. *J. nerv. ment. Dis.* 165, 283-287.
- McGuire R. J., Carlisle J. M. and Young B. G. (1965) Sexual deviations as conditioned behavior: a hypothesis. *Behav. Res. Ther.* 2, 185-190.
- Millenson J. R. and Leslie J. C. (1979) *Principles of Behavioral Analysis*, 2nd edn. Macmillan, New York.
- O'Gorman J. G. (1977) Individual differences in habituation of human physiological responses: a review of theory, method, and findings in the study of personality correlates in non-clinical populations. *Biol. Psychol.* 5, 257-318.
- Pedhazur E. J. (1982) *Multiple Regression in Behavioral Research: Explanation and Prediction*, 2nd edn. CBS College Publishing, New York.
- Quinsey V. L. and Chaplin T. C. (1984) Stimulus control of rapists' and non-sex offenders' sexual arousal. *Behav. Assess.* In press.
- Rachman S. (1966) Sexual fetishism: an experimental analogue. *Psychol. Rec.* 16, 293-296.
- Rachman S. and Hodgson R. J. (1968) Experimentally-induced "sexual fetishism": replication and development. *Psychol. Rec.* 18, 25-27.
- Report of the Commission and Obscenity and Pornography* (1970). Random House, New York.
- Rosen R. C. and Keefe F. J. (1978) The measurement of human penile tumescence. *Psychophysiology* 15, 366-376.
- Schaefer H. H. and Colgan A. H. (1977) The effect of pornography on penile tumescence, as a function of reinforcement and novelty. *Behav. Ther.* 8, 938-946.
- Schmidt G. (1975) Male-female differences in sexual arousal and behavior during and after exposure to sexually explicit stimuli. *Archs sex. Behav.* 4, 353-365.
- Smith D. D. (1976) The social content of pornography. *J. Commun.* 26, 16-33.
- Sokolov E. N. (1963a) Higher nervous functions: the Orienting Reflex. *A. Rev. Physiol.* 25, 545-580.
- Sokolov E. N. (1963b) *Perception and the Conditioned Reflex* (Translated by Waydenfeld S. W.). Macmillan, New York.
- Sokolov E. N. (1969) The modeling properties of the nervous system. In *A Handbook of Contemporary Soviet Psychology* (Edited by Cole M. and Maltzman I.). Basic Books, New York.
- Target Group Index (1968) Vol. M-1. Axiom Research Bureau, New York.
- Winer B. J. (1971) *Statistical Principles in Experimental Design*, 2nd edn. McGraw-Hill, New York.
- Zillmann D. and Bryant J. (1984) Effects of massive exposure to pornography. In *Pornography and Sexual Aggression* (Edited by Malamuth N. M. and Donnerstein E.). Academic Press, New York.