

Factors Associated With Rape as Predictors of Laboratory Aggression Against Women

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This study examined the relation between factors associated with "real"-world aggression against women and laboratory aggression. In the first phase of the research, assessment was made of the attitudes about aggression against women and of the sexual responsiveness to rape of 42 male subjects. In the second phase of the research, which subjects believed was a totally independent experiment, aggression was assessed within a Buss paradigm. It was found that the factors assessed in the first phase successfully predicted men's laboratory aggression in the second research phase. The data are interpreted as supporting the construct validity of (a) theory that suggests that common factors underlie varied acts of aggression against women, (b) the measures designed to predict aggressive tendencies, and (c) the methodology of assessing aggression within a laboratory context.

Empirical research on factors that contribute to men's aggression against women has been quite sparse. Recently, however, there have been two independent lines of investigation that, because of their contributions to theory and to measurement, may provide a basis for further scientific work in this area. These lines of research focused on attitudes facilitating aggression against women and on sexual responsiveness to rape depictions.

Attitudes Facilitating Aggression

Burt (1978, 1980) theorized that certain attitudes that are widely accepted in Western culture and that are particularly held by rap-

ists and potential rapists play an important role in causing rape. Her work especially focused on beliefs in rape myths, which she defines as prejudicial, stereotyped, or false beliefs about rape, rape victims, and rapists (e.g., "women ask for it"). She hypothesized that such beliefs may be used as "psychological releases or neutralizers, allowing potential rapists to turn off social prohibitions against injuring or using others" (1978, p. 282). Burt also proposed that acceptance of rape myths forms part of a large interrelated attitude structure that facilitates various acts of violence against women. This view is similar to Bandura's (1978) exposition of the cognitive mechanisms through which aggressive behavior is disinhibited (e.g., blaming the victim, minimizing the seriousness of the consequences, etc.).

To test her theoretical propositions empirically, Burt (1980) developed a number of scales designed to measure various types of attitudes that may facilitate aggression against women. In a study of the attitudes of a representative sample of Minnesota residents, she found support for the existence of the hypothesized interrelated attitude structure. In particular, she found that responses measuring rape-myth acceptance were strongly related to responses on a scale that primarily measured acceptance of aggression against women. Although these data provide empir-

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ical support for certain aspects of the theoretical propositions advanced by Burt, it is important to determine, as emphasized in a recent analysis of differing approaches to aggression research (Gaebelin, 1981), whether attitude measures actually relate to aggressive behavior.

Sexual Responsiveness to Rape

A second factor that has been found to be associated with acts of violence against women is relatively high sexual arousal to rape depictions. Abel, Barlow, Blanchard, and Guild (1977) sought to find an objective measure of proclivity to rape by contrasting the sexual responsiveness of rapists versus that of nonrapists to depictions of rape and of consenting sex. They found that although rapists showed high and about equal levels of penile tumescence to portrayals of both rape and consenting sex, nonrapists showed substantially higher sexual arousal to consenting sex. Moreover, Abel et al. report that within the rapist sample, higher levels of aggression during the commission of rape tended to be associated with greater sexual responsiveness to rape but not to portrayals of consenting sex. Subsequent research replicated these findings (Abel, Blanchard, Becker, & Djenderedjian, 1978; Abel, Becker, & Skinner, 1980; Barbaree, Marshall & Lanthier, 1979; Quinsey, Chaplin, & Varney, 1981). However, it has also been shown that nonrapists' sexual arousal to rape depictions is inhibited (relative to arousal to depictions of consenting sex) only under certain conditions, such as when the rape depictions accentuate the victim's suffering and abhorrence (Malamuth, Heim, & Feshbach, 1980; Malamuth & Check, 1980a, 1980b, 1983). Furthermore, recent data (Malamuth, 1981b; Malamuth & Check, 1983; Murphy, Krisak, Stalgaitis, & Anderson, Note 1) revealed that among the general population, there exists a sizable minority of men who show a pattern of sexual arousal that is similar to that of rapists (i.e., equal or higher arousal to rape as compared with depictions of consenting sex).

On the basis of their findings, Abel et al. (1977) developed the "rape index," which is a measurement of penile tumescence to rape depictions relative to tumescence to portray-

als of consenting sex. These investigators (see also Abel et al., 1980; Abel, Blanchard, & Becker, 1976, 1978) have argued that this measure serves as an objective index of a proclivity to rape. Using this index, a man whose sexual arousal to rape themes is similar to or greater than his arousal to consenting-sex depictions would be considered as having an inclination to rape. Abel and his associates and other investigators (e.g., Quinsey et al., 1981) have been using this measure in the diagnosis and treatment of rapists and have recently extended it to the identification and treatment of child molesters by comparing their sexual arousal to depictions of child as contrasted with adult sex (Abel, Becker, Murphy, & Flanagan, 1981; Quinsey, Chaplin, & Carrigan, 1980). Quinsey et al. (1980) provided some support for the predictive validity of this assessment technique by showing that it was significantly related in child molesters to recidivism following discharge from a psychiatric institution.

At present, support for the construct validity of the rape index is based only on the "group differences" approach suggested by Cronbach and Meehl (1955), that is, the data indicating that in general, rapists show higher levels of arousal to rape depictions in comparison with nonrapists. However, as noted earlier, it has been consistently found that within the general population, there are many men (who presumably are not rapists) who show the same pattern of arousal to rape and consenting-sex depictions as convicted rapists. This may indicate that these men may have some propensity to aggress against women, although under a wide range of conditions this tendency may not be manifested behaviorally. Alternatively, these data may indicate that arousal to rape is an isolated response that does not have any predictive validity vis-à-vis behavior. Consequently, it is important to assess whether the rape index predicts aggressive behavior.

Reported Likelihood of Raping

Data consistent with the possibility that attitudes facilitating aggression against women and sexual arousal to rape may be indicative of men's inclinations toward aggression against women were obtained in research on

self-reported likelihood of raping. In these studies, men were asked to indicate the likelihood that they personally would rape if they could be assured that they would not be caught (Briere & Malamuth, in press; Check & Malamuth, 1983; Malamuth, 1981a; 1981b; Malamuth & Check, 1980a; 1983; Malamuth, Haber, & Feshbach, 1980; Tieger, 1981). The data have consistently shown that belief in rape myths and acceptance of violence against women are strongly associated with reported likelihood of raping. Further, sexual arousal to rape has also been found to correlate with likelihood-of-raping self-reports, although the relation has not been as strong as that found with attitudes.

The Present Research

The present research was designed to determine whether the factors described above (i.e., attitudes facilitating aggression and sexual responsiveness to rape) would predict men's aggression against a woman within a laboratory setting. Although it is not suggested that laboratory aggression constitutes an actual analogue to the crime of rape, the research was guided by theory that various acts of aggression against women may share some similar underlying causes (e.g., Brownmiller, 1975; Burt, 1980; Clark & Lewis, 1977). I reasoned that if the measures designed to assess attitudes condoning aggression against women and sexual responsiveness to rape are valid indicators of aggressive tendencies, then such measures should predict aggressive behavior. Furthermore, to the extent that laboratory aggression is an indicator of aggressive responses in real-world settings, the laboratory provides a feasible means of assessing aggressive acts. Therefore, if a relation is found between measures of the factors associated with rape and laboratory aggression, support would be provided for the construct validity (Cronbach & Meehl, 1955) of the nomological network comprising (a) the theory that there are common factors linking varied acts of aggression against women; (b) the measures designed to predict aggressive tendencies; and (c) the methodology of assessing aggression within a laboratory context as a basis for testing theory in the area, for further refining the predictive

measures of aggression, and for drawing implications to nonlaboratory settings.

Method

Subjects

Forty-two men participated in both phases of the experiment. They were recruited from 69 participants in a study on responses to sexual and sexually violent stimuli (Ceniti & Malamuth, Note 2). The original sample of 69 subjects was recruited through newspaper ads in university and city newspapers for subjects to participate in sexual research (referred to below as the sexual responses study). Sixty-seven of these 69 participants were university students. Subjects were paid for participating in the research. Following the completion of the sexual responses study, subjects were given written information about a supposedly unrelated experiment that dealt with extrasensory perception (ESP). Subjects were informed that they would be paid \$5 for participating in a session of less than 1 hour. They were asked to list their names if they would be interested in participating in the ESP research. As indicated below, questionnaire data verified that subjects did not see any connection between these two supposedly independent experiments.

Of the 42 subjects who indicated interest in participating in the ESP experiment, only one was not currently a student. This individual was a former student who was currently a practicing engineer. Following the completion of the sexual responses study, these 42 individuals were contacted by phone and scheduled for participation about a week later, although in a few cases participation in the ESP experiment took place a day or two following the sexual responses study. Analyses of the responses of the 42 subjects who had signed up for the ESP experiment versus the 27 who decided not to sign up on the predictive measures used in the present research revealed no significant differences.

Phase 1

Measurement Instruments and Procedure

As part of the sexual responses study, the following measures used in the present research were obtained on all subjects:

Assessment of sexual arousal. Subjects were seated in a comfortable chair located in a sound-attenuated and electrically shielded room equipped with an intercom. Penile tumescence was measured by means of a mercury-in-rubber strain gauge (Davis, Inc., New York City), a device recommended in recent analyses of various physiological measuring instruments (Laws, 1977; Rosen & Keffe, 1978). Changes in penile diameter that resulted in resistance changes in the mercury column of this strain gauge were amplified through a Wheatstone bridge and recorded on a polygraph. Penile tumescence to each depiction was computed on the basis of the maximum positive deflection from baseline, measured just prior to exposure to the story.

Sexual arousal was measured in two sessions, which were separated by 8-9 weeks. In each of these sessions, the subject was given, by the male experimenter, three

written stories in sealed envelopes. These stories depicted various sexual and rape acts. The subject was instructed to place the gauge on his penis and, following a baseline period, was told (via the intercom) when to open each of the envelopes and read the stories. Arousal to these stories was monitored on the polygraph in an adjoining room. When the subject indicated that he had completed each story, his arousal was allowed to return to baseline before proceeding to the next depiction.

In each of the two sessions, the first story depicted a woman masturbating. The primary purpose of this story was to generate some initial level of sexual arousal in light of research data (Kolarsky & Madlafousek, 1977) suggesting that arousal levels are better differentiated if presented following the elicitation of some sexual arousal rather than being presented immediately following the first baseline period. In addition, this story was intended to strengthen the credibility of the experimental instructions that the research concerned responses to various types of stimuli.

The second and third written stories in each of the sessions depicted mutually consenting sex and rape, respectively. The mutually consenting and rape depictions used in the first session were taken directly from those of Abel et al. (1977), and those used in the second session were taken directly from Abel, Blanchard, Becker, and Djenderedjian (1978). These rape depictions emphasize the abhorrence of the rape victim.

The rape index was computed for each subject in both sessions by subtracting sexual arousal to the rape portrayal from sexual arousal to the mutually consenting portrayal. This index was based on Abel et al.'s (1977) approach to developing a single measure of sexual arousal to rape cues relative to mutually consenting intercourse. For various psychometric reasons (e.g., not dividing by a zero), however, the arousal to the consenting-sex depiction was subtracted from arousal to the rape depiction rather than dividing the two arousal scores. The mean difference in arousal to the rape minus the consenting-sex depiction at the first assessment was -1.29 cm, with a standard deviation of 3.89. This difference at the second assessment yielded an average of -3.03 cm, with a standard deviation of 3.03.

Assessment of attitudes facilitating violence. After subjects completed the second session in which sexual arousal was measured, they were asked to complete a questionnaire that assessed various sexual and other issues (see Malamuth & Check, 1981). Embedded within other items dealing with a variety of topics were the Rape Myth Acceptance (RMA; 19 items) and Acceptance of Interpersonal Violence (AIV; 6 items) Scales developed by Burt (1980), who presents data concerning the reliability and validity of these scales. It should be noted that although the AIV Scale refers to acceptance of violence in general, five of the six items concern violence against women. Examples of items from these two scales are "A man is never justified in hitting his wife" (AIV) and "Many women have an unconscious wish to be raped and may then unconsciously set up a situation in which they are likely to be attacked" (RMA). Following most of the items was a scale ranging from 1 ("strongly disagree") to 7 ("strongly agree"). For some items greater agreement with the statement whereas for other items greater disagreement indicates higher rape myth acceptance or acceptance of violence. The mean score on the

RMA scale was 45.60 ($SD = 13.81$), ranging from 22.00 to 82.00. The AIV mean was 18.88 ($SD = 7.14$), ranging from 6.00 to 35.00.

Phase 2

Assignment to ESP Roles

In the second phase of the research (the ESP experiment), a male subject and a female confederate posing as another subject arrived in a designated location near the laboratory. They were met by the experimenter and escorted inside, where they were seated facing the video display terminal. The subject and the confederate were told they would be taking part in an experiment to determine the extent to which punishment affects performance on an ESP task. The task was explained as follows:

We will begin by selecting a transmitter and a receiver. The transmitter will remain at this terminal and will attempt to send a series of numbers to the receiver, who will sit in the adjoining room. The numbers range from 1-4 and there will be 20 trials, with one number presented on each trial. The receiver will attempt to guess what number is being sent on each trial. The transmitter will deliver punishment for incorrect responses. The punishment we are using in this study is aversive noise. The noise ranges from level one, which is quite mild, to level seven which is very unpleasant and irritating, though in no way dangerous or harmful.

The experimenter then inputted the names of the subject and the confederate into a microcomputer. He stated that the computer would randomly select the transmitter and the receiver. The computer was programmed so that the real subject was always assigned the role of transmitter and the confederate the role of receiver. The confederate (receiver) and the subject (transmitter) were then escorted by the experimenter out of the transmitter's room and into the adjoining room in which the receiver would sit during the task. The subject was asked to listen to a 5-sec sample of noise ("Level 3") so that he would have some knowledge of the intensity of the noise available. In reality, there was only one level of noise (70 db [SPL]).

The subject was then escorted by the experimenter to the transmitter's station while the confederate was asked to remain at the receiver's station. The subject was instructed to sit in front of the video terminal and to respond to a series of demographic questions displayed on the screen. When these questions were completed, the subject read a set of instructions that were also displayed on the video terminal. These instructions informed the subject that numbers would be displayed on the screen in front of him. He was requested to concentrate on these numbers for the 7 sec that they appeared. For each incorrect response, the subject was instructed to punish the receiver by choosing one of the numbers one through seven, with each number increasing the aversiveness of the noise stimuli. The instructions also indicated to the subject that research up to this point has shown that punishment had a negative effect on the receiver's performance but that the findings were as yet not fully conclusive. This statement was made in light of the research

of Baron and Eggleston (1972) indicating that it is important to emphasize the negative impact of the punishment to be able to define performance on the "aggression machine" as hostile aggression. The subject was requested to use his own judgment in determining the level of punishment.

Anger Inducement

When the subject completed reading the instruction set, he was asked to fill out an attitude questionnaire, on the pretext that "subjects who see themselves as being similar to one another tend to perform better on ESP tasks." The subject and confederate were both given an attitude questionnaire, which consisted of 10 statements regarding various current political and social issues. The subject was told that the receiver and he would exchange their questionnaires when completed.

At that point the experimenter entered the receiver's room and proceeded to give her the instructions for the ESP task (e.g., pressing the appropriate button on her keyboard whenever the computer told her to do so). She was given the same pretext for filling out the attitude questionnaire. These instructions were given in a loud voice, with the doors to both rooms open, so that they would be audible to the subject.

After the subject finished filling out the questionnaire, the experimenter removed it from the transmitter's room and brought it to the confederate. The experimenter then selected a questionnaire, which ostensibly had been completed by the receiver, with responses generally at the other end of the scale from those the subject had selected. Both the subject and the confederate were then asked to read the other's responses and to write a brief evaluation of the other, based on the answers given on their questionnaire. They were told that these evaluations would be exchanged on completion. The evaluation prepared by the confederate was the same for each subject and was of a negative nature. This evaluation read as follows:

It is very difficult to get a clear impression of someone on the basis of so little information. However, it seems to me that this person and myself are quite unlike. I do feel that he seems quite narrow and phony in his attitudes. I strongly doubt that I could become close to this person or would ever consider dating him.

After the subject read this evaluation, he and the confederate indicated on a scale the likelihood, in their estimation, that they would demonstrate ESP. These ratings were ostensibly to be used to relate attitude similarity and other factors to ESP performance.

Assessment of Punishment

At that point the experimenter informed the subject that they were ready to begin the task. The confederate was asked to place the headphones over her ears. Unknown to the subject, after the experiment began, the confederate removed the headphones and recorded the level of aversive noise given by the subject on each incorrect trial (these data were recorded by the computer as well). The computer gave the same series of responses for each subject. The responses were programmed so that 5 would be correct and 15 incorrect.

Questionnaire and Debriefing

When all 20 trials had been completed, the subject was asked to fill out a posttask questionnaire. In this questionnaire the subject was asked to indicate, on 7-point scales, his motivation for selecting the various levels of punishment he gave the receiver. This questionnaire was based on that of Baron and Eggleston (1972) and inquired to what extent the subject's choices of punishment were motivated by a desire to hurt the receiver, to help the experiment, or to help the receiver. These questions were used to verify that choices of different levels of punishment were motivated only by a desire to hurt the woman. Indications of a desire to hurt were also used as a measure of aggression in conjunction with the measure of aversive noise levels.

As part of the posttask questionnaire, subjects were also asked to rate their mood during the ESP task. Among various "filler" mood adjectives, they were asked to indicate, on a scale ranging from 1 ("not at all") to 7 ("very"), how angry they had felt. The average level of anger reported was 1.98 ($SD = 1.39$).

After the questionnaire was completed, the subject was given a form that inquired about his perceptions of the various elements of the research. Subjects were asked a number of questions regarding what they thought the purpose of the research was and whether they believed this research was related to any other study that they had participated in. Two raters, blind to the subjects' performance, rated these forms and determined that none of the subjects saw any connection between the ESP experiment and the earlier sexual responses study.¹ Subjects were also fully debriefed about the experiment.

Results

Check on Aggression Measure

To determine whether the delivery of aversive noise was based on aggressive motivation, correlations were computed between noise levels and subjects' reported motivations. These analyses revealed that noise levels were associated with a reported desire to hurt the receiver, $r(40) = .55$, $p < .001$, but not with the other motivations (i.e., based on receiver's performance, desire to help exper-

¹ Some subjects were rated as expressing varying degrees of suspicion regarding aspects of the Buss paradigm (e.g., whether there were differing degrees of punishment). Analyses of the data excluding subjects who reported such suspiciousness yielded results that in all aspects were at least as significant, and in most instances showed even stronger relations, as analyses with all subjects (e.g., both the paths from the Attitudes Facilitating Violence and from the Sexual Arousal to Rape factors to the Aggression Against Women factor are clearly significant). In reporting the data below, the more conservative procedure of not excluding any subject from the statistical analyses was used.

iment, or desire to help receiver). These data provided clear support for the conceptualization of the delivery of noise as a measure of hostile aggression. The average level of aversive noise directed against the confederate was 3.42 ($SD = 1.48$).

Structural Equations

The data were analyzed by structural equations using the LISREL IV program (Jöreskog & Sörbom, 1978). This analysis used an approach that embeds factor analysis into a path-analytic type of framework (Bentler, 1978, 1980; Bentler & Speckart, 1979, 1981). A distinction is made between observed variables and latent factors. Scores on particular measures are treated as observed variables that are indicators of latent factors or theoretical constructs that are not directly measured. The advantages of using unmeasured latent factors with observed indicators in structural-equations modeling are discussed in detail elsewhere (Bentler, 1978, 1980; Fink, 1980; Jöreskog, 1977). For the present purposes it should be noted that observed variables contain measurement error whereas latent factors do not. Therefore, estimates of the magnitude of relations among latent factors is more reliable than an approach relating observed variables to each other.

An analysis with latent factors and observed variables is therefore analogous to combining factor analysis and path analysis (Bentler, 1980). The results of this approach provide information in three areas. First, data are provided with respect to a measurement model, which corresponds to factor-analytic loadings relating the observed variables to the latent factors, as well as information on the variances and covariances of measurement errors and of latent factors. Second, information is provided regarding the structural model, which corresponds to a path model consisting of simultaneous regression equations among the latent factors, with allowance being made for the possibility of correlated factor residuals. Finally, a statistical evaluation of the goodness of fit of the entire model that combines both the measurement and structural submodels is provided by a chi-square test. As described in detail below, additional analyses, suggested by Bentler and

Bonett (1980) to test the fit of various aspects of a model, were used in the present analysis.

Description of the Present Model

To determine the ability of factors associated with real-world aggression against women to predict laboratory aggression, the model appearing in Figure 1 was constructed. The notation used in the figure represents latent factors by circles, whereas observed variables are represented by squares. Arrows without origin represent error or unique factors. The path diagram is interpretable as a series of simultaneous regression equations. A variable with a unidirectional arrow aiming at it is a dependent variable in a given equation with as many predictors of that variable as there are such arrows. Each of the unidirectional arrows represents a regression weight. Bidirectional arrows between latent factors indicate that these factors are allowed to freely correlate.

The model displayed in Figure 1 has two predictor factors (Attitudes Facilitating Violence and Sexual Arousal to Rape), which are allowed to freely correlate with each other, as well as one dependent variable (Aggression Against Women). Each of these three latent factors is indicated by two observable variables or measures. The latent factor Attitudes Facilitating Violence is indicated by the Rape Myth Acceptance (RMA) and the Acceptance of Interpersonal Violence (AIV) Scales. The Sexual Arousal to Rape latent factor is indicated by the two different assessments of the rape index (i.e., sexual arousal to rape relative to sexual arousal to consenting themes). The dependent latent factor, Aggression Against Women, is indicated by the levels of aversive noise subjects chose to administer to the female victim and by their reported desire to hurt her.

The measurement-model and the structural-model parameter estimates are presented in Table 1. The measurement-model parameters in the upper half of the table provide information relating the observed variables to the latent factors they are intended to represent. The factor loadings represent standardized regression weights for predicting observed variables from the latent factors, and each error variance represents the vari-

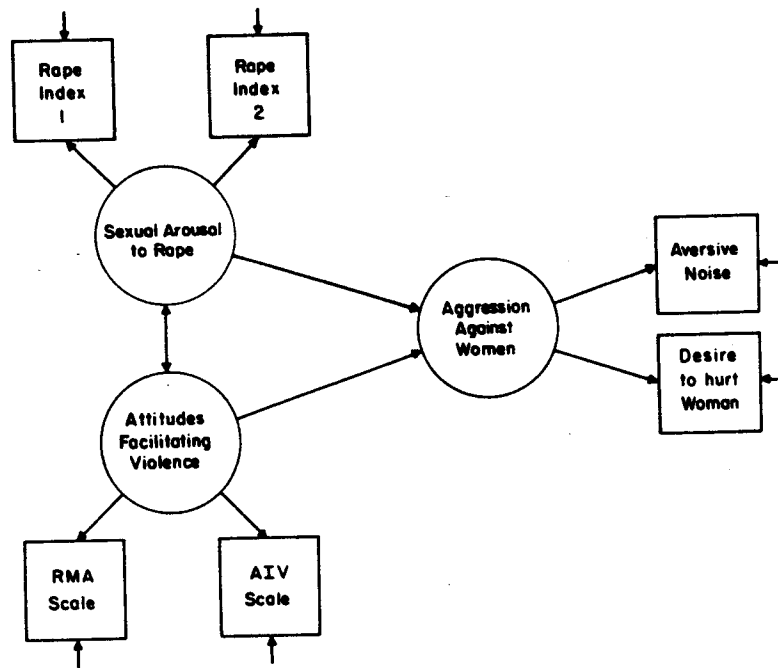


Figure 1. Model of factors associated with real-world aggression against women as predictors of laboratory aggression.

ance that a variable does not share with the other measured variable. As can be seen, the factor loadings are high and quite consistent

for each of the latent variables, and the error variances are generally of moderate magnitude. Therefore, it seems appropriate to con-

Table 1
Standardized Parameter Estimates

Factors and variables	Factor loading	Error variance
Measurement model parameters		
Attitudes Facilitating Violence (A)		
Rape Myth Acceptance Scale	.77	.41
Acceptance of Interpersonal Violence Scale	.97	.05
Sexual Arousal to Rape (B)		
Rape Index 1	.78	.39
Rape Index 2	.77	.40
Aggression Against Women (C)		
Aversive noise	.72	.48
Desire to hurt	.76	.42
Structural model parameters		
	Standardized weight	Critical ratio
Factor correlations		
A × B	.32	1.84
Regression weights		
A × C	.38	1.94
B × C	.42	2.01
Standardized residual variance		.57
Aggression Against Women		

clude that the observed variables are adequate indicators of the latent factors.

The structural-model parameters appear in the lower half of Table 1. As indicated in this table, the standardized regression weights of the path coefficients are quite large. A statistical test is available for the hypothesis that a particular path coefficient is zero. The parameter estimate divided by its standard error gives the critical ratio (CR), which is distributed approximately as a *Z*. Therefore, a CR greater than ± 1.96 suggests a significant path. The CRs for the two path coefficients are also shown in Table 1. The CR for the path coefficient relating Attitudes Facilitating Violence with Aggression Against Women is 1.94, which is very close to significant (i.e., $p < .053$). Further analyses reported below suggest that this path should be considered as statistically significant. Similarly, the path coefficient relating Sexual Arousal to Rape with Aggression Against Women was found to be significant (i.e., a CR of 2.01). The factor correlation between the two independent latent factors, Attitudes Facilitating Violence and Sexual Arousal to Rape, only approached conventional levels of statistical significance (i.e., a CR of 1.84).

The standardized residual variance at the bottom of Table 1 indicates the percentage or proportion of the dependent latent-factor variance not accounted for by the independent latent factors. This value is essentially equivalent to a $1 - R^2$ in a multiple regression equation. This value indicates that the predictor factors (i.e., Sexual Arousal to Rape and Attitudes Facilitating Violence) accounted for 43% of the variance of the dependent factor (i.e., Aggression Against Women).

Table 2 presents the results of chi-square tests of the overall fit of the model. At the top of the table is the chi-square of the model appearing in Figure 1 (referred to as the substantive model). The nonsignificant chi-square suggests that the model cannot be rejected (i.e., that the model appears to represent the data successfully).

In view of the small-sample-size issue,² however, further model comparisons suggested by Bentler and Bonett (1980) for small samples were computed and are presented in Table 2. These comparisons are designed for

Table 2
Chi-Square Tests of the Model and Comparisons With Other Models

Model	Chi-square	df	<i>p</i>
Substantive	8.05	6	.23
Null	90.75	15	.0000
Orthogonal	23.93	10	.008
One factor	27.69	8	.0005
Variante 1	14.65	8	.07
Variante 2	17.70	8	.03
Comparisons			
Substantive vs. null	82.68	9	.001
Substantive vs. orthogonal	15.88	4	.01
Substantive vs. one factor	19.64	2	.001
Substantive vs. Variante 1	6.60	2	.05
Substantive vs. Variante 2	9.65	2	.01

Note. Incremental fit index: $\lambda = (90.75 - 8.05) / 90.75 = .91$.

the sequential evaluation of the statistical necessity of various sets of parameters of a covariance structural model (such as that presented in Figure 1). Using this approach, alternative models that are subsets of the model of interest are specified. The difference in chi-square values between the model of interest (i.e., the substantive model) and each of the subset models is itself a chi-square statistic that may be utilized to test the importance of the parameters that differentiate the models.

The first submodel evaluated was the null model, which specifies that all of the variables are mutually independent (i.e., all common factor loadings are simultaneously set to zero, thereby equating all the unique variances with the variances of the manifest variables). As can be seen in Table 2, such a model is clearly rejected by the chi-square analysis, and the comparison between the substantive and null models is significant.

The second submodel investigated is referred to as the orthogonal model. This model includes the factor structure linking the observed variables to the underlying latent factors but removes any links (i.e., paths)

² Recent evidence suggests that the likelihood-ratio statistic may be more reliable in small samples than was previously assumed (Geweke & Singleton, 1980).

among the latent factors. Table 2 indicates that this model is also rejected and that the comparison between the substantive and the orthogonal models is significant.

A third submodel evaluated, referred to as the one-factor model (e.g., Kerlinger, 1980), specified that all of the predictor variables (i.e., RMA, AIV, Rape Index 1, Rape Index 2) are indicators of the same underlying factor rather than, as in the substantive model, representing two distinct factors. The one-factor model was also rejected and was found to significantly differ from the substantive model.

Two additional model variants were analyzed. These are referred to in Table 2 as Variant 1 and Variant 2. These specify removing individually the path from each of the latent predictor factors to the dependent factor (i.e., Aggression Against Women). Variant 1, which involves removing only the path from the Sexual Arousal to Rape factor to the dependent factor yields a chi-square value that approaches conventional levels of statistical significance and significantly differs from the substantive model. Similarly, Variant 2, which involved removing only the path from the Attitudes Facilitating Violence factor, was rejected by the chi-square analysis and differed significantly from the substantive model. These data provide further support for the contribution of two distinct factors in accounting for the variance of the dependent factor.

Finally, the incremental-fit index (Bentler & Bonett, 1980) is presented in the footnote to Table 2. This index represents the overall fit of the substantive model in relation to the null model. It yields a value ranging between zero and one. The value of .91 obtained in this analysis provides further support for the conclusion that the model displayed in Figure 1 accounts for a statistically as well as a practically significant portion of the data.

Discussion

The results indicate that factors associated with real-world aggression against women successfully predicted men's laboratory aggression against a female. Both the factor Attitudes Facilitating Violence and the factor Sexual Arousal to Rape were found to con-

tribute independently to the prediction of laboratory aggression, that is, greater predictive success was achieved by the information derived from using both of these factors than by employing either factor alone. Together these two predictor factors accounted for 43% of the variance of the dependent factor (i.e., Aggression Against Women).

It is hoped that the present data will serve as a basis for the development and testing of more detailed models that may account for the relations found. Although conceptually it is not difficult to explain the association between attitudes that condone aggression against women and aggressive behavior, the basis for the relation between relatively high sexual responsiveness to rape and aggressive behavior is less apparent. It may be that a common characteristic, such as hostility toward women, underlies both of these responses. To assess such a possibility requires further development both of theory and of valid measures.

Very recently, Malamuth and Check (Note 3) attempted to replicate and extend one aspect of the relations found in the present study. They administered the AIV Scale as well as a measure of General Acceptance of Violence (GAV) to 72 male subjects. The GAV was designed to measure attitudes about aggression in general rather than aggression specifically directed against women (which is the focus of the AIV Scale). As in the present study, several days following the administration of these scales, subjects' laboratory aggression against a woman was assessed. The AIV scale successfully predicted aggression against the woman, but no relation was found between the GAV scale and such aggressiveness. These data suggest that aggression against women may not simply reflect general aggressive tendencies but may be governed by certain unique determinants. To investigate this issue further, it would be useful to examine the relation between predictive variables and aggression against male as well as female targets.

As noted in the introduction, the finding of relations between factors associated with rape and laboratory aggression provides support for the construct validity of a nomological network comprising a number of elements. Particularly noteworthy is the rele-

vance of the data to questions concerning the generalizability of conclusions derived from laboratory investigations of behavioral aggression, the most widely used approach in human aggression research (Baron, 1977; Geen & O'Neal, 1976; Zillmann, 1978). There has been considerable controversy recently regarding the construct validity of such laboratory aggression procedures (Berkowitz & Donnerstein, 1982; Edmunds & Kendrick, 1980; Kaplan, in press), with reviewers emphasizing the need for validation studies (e.g., Edmunds & Kendrick, 1980). By showing that physiological and attitudinal measures dealing with real-world aggression significantly relate to laboratory aggressive behavior, the present data provide strong support for the construct validity of such laboratory research on aggression in general and for investigations focusing on aggression against women in particular (e.g., Donnerstein, 1980; Donnerstein & Berkowitz, 1981; Malamuth & Donnerstein, 1982; Richardson, Note 4).

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