

# A Meta-Analysis of Rape Education Programs

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Meta-analysis of evaluation studies of rape education programs aimed at college students examined which program characteristics were related to participants' rape-supportive attitude change. Linear regression analyses revealed that: (a) published studies yielded greater attitude change than dissertations, presentations, or unpublished studies; (b) attitude change declined over time; and (c) men in mixed-gender groups experienced less attitude change after interventions than men in single-gender groups. Implications for the development of effective rape education programs are discussed.

Educational programs among college students to change rape-supportive attitudes are the most common form of rape prevention interventions. In fact, federal government regulations have made rape prevention efforts mandatory at all colleges and universities funded by the government (Heppner et al., 1995a), and numerous evaluations have been conducted in order to determine their effectiveness. The evaluations and the programs themselves differ on numerous dimensions including the gender of the target audience, the outcome measures, the format of the intervention, and the follow-up time after the intervention. In order for colleges to implement successful programs, the characteristics that result in desirable attitude changes need to be identified. The large number of studies available permit the use of meta-analysis to integrate the various sexual assault prevention program evaluations for college students.

Many different constructs have been examined as dependent measures in the evaluations of rape prevention programs. Various types of attitudes have been assessed including: rape myth acceptance, sex role stereotyping, adversarial sexual beliefs, acceptance of interpersonal violence, sexual conservatism, attitudes toward women, and levels of empathy toward victims. Some program evaluations have also included more behavioral types of dependent measures such as self-reported likelihood of raping, self-reported sexual victimization, sexual communication, and dating behavior intentions.

The most common dependent measure used in program evaluations are scales measuring attitudes toward rape, such as the Rape Myth Acceptance Scale (Burt, 1980), therefore change in rape-supportive attitudes of program participants was examined in this meta-analysis. According to Burt (1980, p. 217), rape myths are "defined as prejudicial, stereotyped, or false beliefs about rape, rape victims, and rapists." Some examples of rape myths,

as provided by Burt (1980, p. 217), are "only bad girls get raped"; "women ask for it"; and "any healthy woman can resist a rapist if she really wants to." Rape myths are problematic because they attribute blame to the victim and exonerate the offender (Breitenbecher, 2000).

Lonsway and Fitzgerald (1994, 1995) recently criticized the various scales measuring rape myth acceptance. They argued that rape myth acceptance scales are riddled with problematic wording, items with more than one idea, and outdated items. They also stated that not all measures have been content validated. According to Lonsway and Fitzgerald (1994), there are widely varying measures of rape myth acceptance because studies have failed to use consistent definitions. Therefore, they developed the following definition of rape myth acceptance: "attitudes and beliefs that are generally false but are widely and persistently held, and that serve to deny and justify male sexual aggression against women" (Lonsway & Fitzgerald, 1994, p. 134). However, despite their flaws, rape myths are still important to study, as emphasized by Lonsway and Fitzgerald (1994).

There are two main assumptions underlying rape intervention programs that use rape-supportive attitudes as their dependent measure. The first is that education can change rape-supportive attitudes, and the second is that this attitude change will then lead to decreased sexual aggression. Past research has shown that the holding of rape-supportive attitudes is related to both sexually aggressive behavior and self-reported likelihood of raping (e.g., Breire & Malamuth, 1983; Greendlinger & Byrne, 1987; Hamilton & Yee, 1990; Koss, Leonard, Beezley, & Oros, 1985; Malamuth, 1981; Muehlenhard & Linton, 1987; Murphy, Coleman, & Haynes, 1986; Reilly, Lott, Caldwell, & DeLuca, 1992).

The relationship between rape-supportive attitudes and sexual assault perpetration has not been shown to be causal. The possibility still exists that these rape-supportive attitudes develop in men after perpetration of sexual assault in order to mitigate negative feelings (Koss, Leonard, Beezley, & Oros, 1985). Because it has not been empirically established that reducing rape-supportive attitudes leads to less sexual assault perpetration, researchers have argued that program evaluations should move beyond attitude change as an outcome measure to include more behavioral outcomes (Breitenbecher, 2000; Gidycz, Dowdall, & Marioni, in press; Lonsway, 1996; Schewe & O'Donohue, 1993; Yeater & O'Donohue, 1999). Unfortunately, thus far, few program evaluations have addressed whether rape prevention programs result in an actual decrease in sexual perpetration by men and the sexual victimization of women. Without collecting information on the incidence of sexual assault, it is difficult to know if these programs have had any effect on sexual assault rates (Yeater & O'Donohue, 1999).

Even though a causal link between rape-supportive attitudes and sexual aggression has not been proven, it is still important to find out if these programs have been successful in changing attitudes due to findings from the general attitude-behavior research (for reviews, see Ajzen & Fishbein, 1977; Cialdini, Petty, & Cacioppo, 1981). At the least, changing people's rape-supportive attitudes may create a social climate that is less hostile to rape victims. Because the majority of programs have focused only on attitude change, there is a need to discover if they have been effective in reducing rape-supportive attitudes. Meta-analysis can also be a powerful way to confirm statements made in recent literature reviews about the effects of rape prevention programs, such as the reduction in attitude change at follow-up periods (Breitenbecher, 2000; Gidycz, Dowdall, & Marioni, in press).

Rape intervention programs have targeted male audiences, female audiences, and mixed audiences. Many researchers have advocated the use of single-gender audiences for a variety of reasons (Bachar & Koss, in press; Berkowitz, 1994; Berkowitz, Burkhardt, & Bourg, 1994; Breitenbecher, 2000; Foubert & Marriott, 1996; Gidycz, Dowdall, & Marioni,

in press; Lonsway, 1996; Ring & Kilmartin, 1992; Rozee & Koss, in press; Schewe & O'Donohue, 1993; Yeater & O'Donohue, 1999). First of all, rape prevention programs for men and women have different goals. Programs targeting men strive to prevent the perpetration of sexual assaults, while programs directed at women are more accurately referred to as risk reduction programs rather than prevention programs (Bachar & Koss, in press; Gidycz, Dowdall, & Marioni, in press). According to Bachar and Koss (in press), mixed-gender programs may not be able to accomplish the mutually exclusive goals of rape prevention and rape avoidance without polarizing program participants.

Furthermore, mixed-gender interventions may offer inappropriate information for men (Yeater & O'Donohue, 1999). For example, in mixed groups, men may learn that rape is common (or normal) and that there are few negative consequences for men who rape (Schewe & O'Donohue, 1993; Yeater & O'Donohue, 1999). Berkowitz, Burkhardt, and Bourg (1994) argue that mixed-gender programs unintentionally reinforce differences between men and women and promote the perception of adversarial male-female relationships. Therefore, mixed-gender programs need to be careful in their selection of information (Schewe & O'Donohue, 1993) which may then limit their effectiveness.

Men may perceive mixed-gender programs to be accusatory and threatening, therefore they may be reluctant to attend. After attending a male-only program, participants reported being more willing to participate and feeling less defensive and more open to asking questions (Ring & Kilmartin, 1992). It is argued that male-only programs allow men to speak more honestly without fear of judgment or criticism by women and that it is less likely they will be passive (Berkowitz, 1994; Rozee & Koss, in press). Berkowitz, Burkhardt, and Bourg (1994) state that most of the variables predictive of the likelihood of sexual assault are associated with men's experiences in all-male environments or with close male peers, therefore this is the ideal situation for rape prevention programming.

In the present study, a meta-analysis was conducted to determine the effectiveness of rape prevention programs in reducing rape myth acceptance/rape-supportive attitudes of college students. Flores and Hartlaub (1998) completed a similar meta-analysis of 15 evaluations of interventions designed to reduce rape myth acceptance in male college students. The present study differed from this previous study in several ways. First, this study examined the effects of programs targeting men, women, and mixed audiences. Whenever possible, for studies of mixed audience programs, comparisons were made separately for men and women based on past research showing that they differ significantly on acceptance of rape myths (see Anderson, Cooper, & Okamura, 1997 for a meta-analysis of individual differences and attitudes toward rape). An additional focus of this study was on whether single-gender or mixed-gender groups were more effective in changing attitudes. Furthermore, dissertations were also included to reduce any bias introduced by examining only published evaluations with significant findings. Therefore, a greater number of studies were included in this analysis compared to the meta-analysis by Flores and Hartlaub (1998).

In their meta-analysis, Flores and Hartlaub (1998) found no relationship between intervention type and effect sizes, demonstrating that the reduction of rape myth acceptance did not differ by intervention type. In addition, the effectiveness of programs in reducing rape myth acceptance did not differ by length of the intervention. Weaker effect sizes were also found for longer intervals between the intervention and post-tests.

The present study used linear regression analyses to determine which moderator variables were responsible for reducing rape-supportive attitudes in participants, when controlling for several variables such as program length and follow-up time. Several hypotheses were tested based on previous research. Participants in single-gender groups were expected to be

more likely to change their attitudes compared to those in mixed-gender groups, based on past literature endorsing the use of single-gender groups in rape prevention programming (Bachar & Koss, *in press*; Berkowitz, 1994; Berkowitz, Burkhardt, & Bourg, 1994; Breitenbecher, 2000; Foubert & Marriott, 1996; Gidycz, Dowdall, & Marioni, *in press*; Lonsway, 1996; Ring & Kilmartin, 1992; Rozee & Koss, *in press*; Schewe & O'Donohue, 1993; Yeater & O'Donohue, 1999). It was also expected that published studies would be associated with more attitude change in participants than dissertations, presentations, or unpublished studies, based on past research showing that published studies are more likely to report significant findings than unpublished studies (Sterling, 1959). Both length and type of intervention were expected to be unrelated to attitude change in participants, as shown by Flores and Hartlaub (1998). Finally, it was hypothesized that post-tests occurring at longer follow-up times would be associated with less attitude change in participants compared to immediate post-tests (Breitenbecher, 2000; Flores & Hartlaub, 1998; Gidycz, Dowdall, & Marioni, *in press*).

## METHOD

### Literature Search

The studies used in the present meta-analysis were obtained through a variety of sources. Computerized literature searches were conducted in the following databases: PsycINFO (for the years 1967 to July, 1999), Eric (1984 to June, 1999), Uncover (1988 to 1999), Wilson Social Science Abstracts (1984 to June, 1999), and Dissertation Abstracts International (1861 to July, 1999). The searches were done using the keywords "rape prevention"; "rape education"; and "rape intervention." In addition, the reference lists of two literature reviews (Lonsway, 1996; Schewe & O'Donohue, 1993) and one meta-analysis (Flores & Hartlaub, 1998) on this topic were used to gather articles. Finally, the reference sections of the articles obtained by the procedures explained above were examined for additional potentially relevant articles not previously located.

To be included in the meta-analysis, a study had to meet certain criteria. First, the study had to be an empirical evaluation that included treatment and no-treatment control groups, pre- and post-tests, or a combination of both in a rape prevention program for college students only.<sup>1</sup> The dependent variable had to be a scale measuring either rape myth acceptance or attitudes toward rape. Scales utilized in studies included in the meta-analysis included the Rape Myth Acceptance Scale (Burt, 1980), Forcible Date Rape Scale (Giarusso, Johnson, Goodchilds, & Zellman, 1979 as cited in Fischer, 1986), Attitudes Toward Rape Questionnaire (Barnett & Feild, 1977), Acceptance of Rape Myths Scale (Gilmartin-Zena, 1987), General Attitudes Toward Rape Scale (Larsen & Long, 1987 as cited in Wolford, 1993), Rape Supportive Attitudes Scale (Lottes, 1988 as cited in Berger, 1993), RAPE Scale (Bumby, 1996), and other scales constructed by the author(s) for use in their evaluations.

Forty-five studies met the criteria for inclusion in the meta-analysis. Of these 45 studies, 22 were published studies, and 23 were dissertations, presentations, or unpublished studies. Ninety-two percent of relevant dissertations were included in the meta-analysis. Dissertations were obtained either through interlibrary loan or attempts to contact the authors and/or the dissertation chairpersons by phone or through e-mail. However, two dissertations were not able to be located through these methods. If a dissertation was later published, only the published study was used.<sup>2</sup> Because many studies used more than one type of intervention, post-tests at different follow-up intervals, and/or multiple dependent variables, there were 153 comparisons to be evaluated.

Effect sizes ( $d$  statistic) were calculated (Wolf, 1986) for each comparison as a standardized measure in order to determine to what extent rape-supportive attitudes were reduced in each program. For studies that claimed "no statistical difference" or "no effect" of the treatment and did not report the means and standard deviations or a bivariate comparison for the treatment and control group (or pre- and post-test), an effect size of 0 was imputed. When studies reported means and standard deviations for dependent variables for either the pre- and post-tests and/or for the treatment and control groups, these values were used to calculate  $t$ -tests, which were then used to calculate the effect sizes.<sup>3</sup>

## Moderator Variables

Various aspects of the programs were coded for inclusion in the study, and a list of the studies included in the meta-analysis and their values for the moderator variables is presented in Table 4. The *year* of the study was included as a moderator variable. *Source of data* distinguished between dissertations, presentations, or unpublished studies (coded as 0) and published studies (coded as 1). Programs targeted male audiences, female audiences, or mixed audiences. Whenever possible, for studies of mixed audience programs, comparisons were made for men and women separately. However, in some studies, only the results for men and women combined were reported. For *gender of participants*, dummy coding was used with men in single-gender groups as the reference group. The variables coded were: men and women combined in mixed groups (0 = no, 1 = yes), women in mixed groups (0 = no, 1 = yes), and men in mixed groups (0 = no, 1 = yes).<sup>4</sup> *Intervention type* was coded in the following categories ranging from least to most interactive: brochure, video or play, lecture, both lecture and video, lecture and/or video plus discussion, workshop (including interactive theater), and course. *Length of the intervention* was coded in categories of 30 minutes or less, between 31 and 60 minutes, between 61 and 90, over 90, and college course. *Follow-up time* (between the intervention and the post-test) was categorized as immediately following the intervention, 1 to 5 weeks, 6 to 10 weeks, or more than 10 weeks.<sup>5</sup> When a study reported the follow-up period in months, the number of months was multiplied by four as an estimate for the number of weeks. *Sample size* of the comparison and the *number of comparisons* within each study were also each included as moderators.

## RESULTS

### Sample Characteristics

Frequencies and means (whichever is most appropriate) for the moderator variables are presented in Table 1. The mean year of publication (or completion for dissertations) for the comparisons was 1993.62 ( $SD = 3.85$ ). Forty-five percent of the comparisons included in the meta-analysis were published studies. Of the 153 comparisons, the majority of programs (71.2%) were presented to mixed audiences. Twenty-eight percent targeted only male audiences, and the remaining 0.7% targeted only female audiences. Thirty-nine percent of the interventions involved video and/or lecture, while another 23.5% included discussion in addition to the video and/or lecture. Twenty-seven percent of interventions were workshops, 9.2% courses, and 1.3% involved brochures. Seven percent of the interventions were 30 minutes or less, while more than half (53.4%) were between 31 and 60 minutes. Close to one-third of the programs (30.1%) were over 60 minutes, and college courses comprised 9.6% of the interventions. Post-tests were given immediately after the programs in 37.9% of the comparisons.

TABLE 1. Means and Frequencies for Moderator Variables

	<i>M</i>	<i>SD</i>
Year of Study	1993.62	3.85
Sample Size of Comparison	101.63	95.90
Number of Comparisons in each Study	5.89	3.71
Effect Size	.35	.44
	<i>N</i>	%
Source of Data		
Dissertation/Pres./Unpub.	84	54.9
Published Study	69	45.1
Participant Gender		
Men—Single Gender Group	43	28.1
Men—Mixed Gender Group	36	23.5
Men & Women—Mixed	37	24.2
Women—Mixed Gender Group	36	23.5
Women—Single Gender Group	1	.7
Intervention Type		
Brochure	2	1.3
Video/Play	17	11.1
Lecture	21	13.7
Video and Lecture	22	14.4
Lecture and/or Video plus Disc.	36	23.5
Workshop/Interactive Theater	41	26.8
Course	14	9.2
Intervention Length		
30 Minutes or Less	10	6.8
31 to 60 Minutes	78	53.4
61 to 90 Minutes	27	18.5
91 Minutes or Longer	17	11.6
Course	14	9.6
Follow-up Time		
Immediately After Program	58	37.9
1 to 5 Weeks Later	42	27.5
6 to 10 Weeks Later	24	15.7
More than 10 Weeks Later	29	19.0

In 43.2% of the comparisons, the follow-up post-test was delayed 1 to 10 weeks after the program, and 19.0% gave the post-test more than 10 weeks later. The mean number of participants in each comparison was 101.63 ( $SD = 95.90$ ), and the average number of comparisons within each study was 5.89 ( $SD = 3.71$ ). The overall mean effect size was .35 ( $SD = .44$ ), which represents a moderate reduction in participants' rape myth acceptance (Range =  $-.76$  to  $2.15$ ). Eighty-two percent of the effect sizes were positive, demonstrating that the majority of comparisons resulted in an attitude change in the desired direction.

### Linear Regression Analyses

A regression analysis was calculated including year of study, source of data, gender of participants, intervention type, length of the intervention, follow-up time, sample size of comparison, and number of comparisons within each study as predictors of the effect sizes.<sup>6</sup> Results of the regression model are shown in Table 2.

**TABLE 2. Regression Model Predicting Effect Size for All Participants**

Variable	<i>b</i>	<i>SE</i>
Year of Study	.009	.010
Source of Data	.287***	.075
Mixed Gender Group	-.156	.118
Women in Mixed Group	-.251*	.104
Men in Mixed Group	-.266*	.105
Intervention Type	.016	.029
Length of Intervention	.039	.045
Follow-Up Time	-.085**	.032
<i>N</i> of Comparison	-.001**	.000
Number of Comparisons	-.027**	.010

$F(10, 134) = 5.21, p = .000$

Adjusted *R* Square = .23

*Note.* Year of study (1978 to 1999); Source of data (0 = dissertation, presentation, or unpublished study, 1 = published study); Mixed gender group (0 = no, 1 = yes); Women in mixed group (0 = no, 1 = yes); Men in mixed group (0 = no, 1 = yes); Intervention type (1 = brochure, 2 = video or play, 3 = lecture, 4 = video and lecture, 5 = lecture and/or video plus discussion, 6 = workshop or interactive theater, 7 = course); Length of Intervention (0 = 30 minutes or less, 1 = between 31 and 60 minutes, 2 = between 61 and 90 minutes, 3 = longer than 90 minutes, 4 = course); Follow-up time (0 = immediately after program, 1 = 1 to 5 weeks, 2 = 6 to 10 weeks, 3 = more than 10 weeks); *N* of comparison (Sample size of comparison); Number of comparisons (within each study).

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

Published studies were associated with larger effect sizes compared to dissertations, presentations, or unpublished studies. The regression model demonstrated that male participants in mixed-gender groups and female participants in mixed-gender groups experienced less attitude change than men in single-gender groups. Longer follow-up times were associated with smaller effect sizes. Larger sample sizes and more comparisons within a study were each associated with smaller effect sizes.

A second regression analysis was calculated to determine whether the effect size of attitude change in male participants would differ based on group composition (single or mixed-gender groups).<sup>7</sup> The same variables from the first regression analysis were included in this model. Results are shown in Table 3.

As in the first model, published studies were related to greater attitude change than dissertations, presentations, or unpublished studies. Male participants in mixed-gender groups were significantly less likely to reduce their rape-supportive attitudes compared to men in single-gender groups. Longer follow-up times and larger sample sizes were each associated with less attitude changes.

## DISCUSSION

A meta-analysis was conducted to determine which program characteristics were associated with decreases in participants' rape myth acceptance. As hypothesized, this study demonstrated that interventions had more impact on male participants in single-gender than in mixed-gender groups. Single-sex audiences in rape prevention programs have been greatly endorsed in the literature (Bachar & Koss, in press; Berkowitz, 1994; Berkowitz,

**TABLE 3. Regression Model Predicting Effect Size for Single Versus Mixed Male Groups**

Variable	<i>b</i>	<i>SE</i>
Year of Study	-.006	.014
Source of Data	.500***	.106
Single or Mixed Gender Group	-.487***	.129
Intervention Type	.044	.038
Length of Intervention	-.067	.070
Follow-Up Time	-.152***	.043
<i>N</i> of Comparison	-.004***	.001
Number of Comparisons	-.017	.015

*F* (8, 69) = 9.76, *p* = .000

Adjusted *R* Square = .48

*Note.* Year of study (1978 to 1999); Source of data (0 = dissertation, presentation, or unpublished study, 1 = published study); Single or mixed gender group (0 = men in single-gender groups, 1 = men in mixed-gender groups); Intervention type (1 = brochure, 2 = video or play, 3 = lecture, 4 = video and lecture, 5 = lecture and/or video plus discussion, 6 = workshop or interactive theater, 7 = course); Length of Intervention (0 = 30 minutes or less, 1 = between 31 and 60 minutes, 2 = between 61 and 90 minutes, 3 = longer than 90 minutes, 4 = course); Follow-up time (0 = immediately after program, 1 = 1 to 5 weeks, 2 = 6 to 10 weeks, 3 = more than 10 weeks); *N* of comparison (Sample size of comparison); Number of comparisons (within each study).

\**p* < .05. \*\**p* < .01. \*\*\**p* < .001.

Burkhart, & Bourg, 1994; Breitenbecher, 2000; Foubert & Marriott, 1996; Gidycz, Dowdall, & Marioni, in press; Lonsway, 1996; Ring & Kilmartin, 1992; Rozee & Koss, in press; Schewe & O'Donohue, 1993; Yeater & O'Donohue, 1999). Because the content of single-gender and mixed-gender programs may vary greatly (as it should), this factor may explain the differences in attitude change rather than the gender of the target audience. Perhaps, in the male-only programs, program content was geared more toward discussion of rape-supportive attitudes and other cognitive factors associated with rape perpetration, which may have more directly affected levels of rape myth acceptance.

Regression models also demonstrated that women in mixed-gender groups were less likely to experience attitude change than men in single-gender groups. Women are generally less accepting of rape myths than men (Anderson, Cooper, & Okamura, 1997). As several studies have suggested (Harrison, Downes, & Williams, 1991; Heppner et al., 1995b; Layman-Guadalupe, 1996), there may be a ceiling effect operating, with little room for change in women's attitudes. Unfortunately, the attitudes of women in single-gender and mixed-gender groups could not be compared in this study because only one intervention targeted the rape-supportive attitudes of female audiences as a single-gender group. Interventions may be more effective at changing women's attitudes in a single-gender setting. Clearly, more programs directed at female audiences are needed (Yeater & O'Donohue, 1999).

Because the rape-supportive attitudes do not differ significantly between non-victims and victims of rape (Koss, 1985; Koss & Dinero, 1989), targeting the changing of women's rape-supportive attitudes may not be as useful as targeting male attitudes. The constructs identified as important for changing behavior in men may not be relevant for women (Yeater & O'Donohue, 1999). Instead, as suggested in the introduction, programs targeting women should emphasize situational risk education and rape avoidance techniques.

The role of gender in moderating treatment outcomes is not totally clear. In a summary of the moderating effects of gender (including all dependent measures not just rape myth acceptance), Breitenbecher (2000) reported that half of the program evaluations did not find



significant interactions between gender and program outcomes. Of the studies that did find significant interactions, some programs demonstrated desirable changes in men, while others found undesirable changes. Therefore, it is difficult to state concrete conclusions as to role of gender in program outcomes, and further investigation is necessary.

Similar to the findings of Flores and Hartlaub (1998), longer follow-up times were related to less attitude change. Immediate post-tests showing significant attitude changes may be deceiving and may actually be due to demand characteristics (Bachar & Koss, *in press*; Lonsway, 1996). This failure to maintain positive treatment effects also points to the importance of longer follow-up periods between the programs and post-tests to monitor the stability of attitude change. It may not be realistic to expect that people's long-held attitudes can be changed in a lasting way by a single intervention. Anderson and her colleagues (1998) suggest that a variety of programs should be offered throughout college, which may then result in a cumulative effect in attitude change. These "booster sessions" could serve as reminders of what was learned in previous programs (Heppner et al., 1995b).

Both length and type of intervention did not significantly affect attitude change in participants, confirming the findings of Flores and Hartlaub (1998). For example, a short video presentation had the same effect on participants' attitudes as a longer workshop. This is important from a funding point of view because long intensive programs can cost more than a videotape or lecture. This also demonstrates that information presented through mass media, such as public service announcements, may have the potential to change rape-supportive environments, as Youn (1987) has advocated.

Even if the length of the program does not relate to effect size, the number of sessions in the presentation might. Programs that are broken into smaller increments may be more effective. Research has shown greater learning with spaced presentation of information compared to massed presentations (Dempster & Farris, 1990). This is an important issue to address in future research.

As predicted, published studies produced larger effect sizes of attitude change compared to dissertations, presentations, or unpublished studies. This finding is not surprising given that published studies are more likely to report significant findings (Sterling, 1959). This also demonstrates the importance of including non-published studies in meta-analyses and literature reviews in order to avoid biased conclusions.

Larger sample sizes in the comparisons and more comparisons within studies were each related to weaker effect sizes. It may be that programs are more effective at changing attitudes in smaller groups of participants, perhaps because the interventions are slightly more personalized. However, the majority of studies did not state whether the participants in the treatment group were involved in one large group or several small groups, therefore this relationship could not be further examined. Future research should attempt to discover whether participants are more likely to change their attitudes in a small or large group setting.

The present study included only evaluations of programs that targeted the changing of rape-supportive attitudes. As stated earlier, rape-supportive beliefs have been shown to be related to sexually aggressive behavior and self-reported likelihood of raping (e.g., Breire & Malamuth, 1983; Greendlinger & Byrne, 1987; Hamilton & Yee, 1990; Koss, Leonard, Beezley, & Oros, 1985; Malamuth, 1981; Muehlenhard & Linton, 1987; Murphy, Coleman, & Haynes, 1986; Reilly, Lott, Caldwell, & DeLuca, 1992). However, changes in rape-supportive attitudes are not sufficient evidence from which to infer reduction in actual sexual assault incidents. There is no way of knowing if the actual behavior of the program participants changed based on attitude change alone. Therefore, no conclusions can be made as to the effectiveness of these programs in reducing the incidence of rape.

**TABLE 4. Summary of Studies**

Study	Moderator Variable <sup>a</sup>							
	d	1	2	3	4	5	6	7
Abrams, 1992	.00	0	1	3	2	0	127	4
	.00	0	1	3	2	1	127	4
	.00	0	1	4	2	0	123	4
	.00	0	1	4	2	1	123	4
Anderson et al., 1998	.45	1	3	5	1	0	140	8
	.00	1	3	5	1	2	129	8
	.24	1	3	6	1	0	146	8
	.02	1	3	6	1	2	134	8
	.37	1	3	5	1	0	141	8
	.14	1	3	5	1	2	129	8
	.44	1	3	6	1	0	146	8
	.14	1	3	6	1	2	135	8
Berger, 1993	.79	0	1	6	3	0	77	2
	.41	0	1	6	3	3	77	2
Borden, Karr, & Caldwell-Colbert, 1988	-.22	1	2	3	1	1	50	2
	.10	1	4	3	1	1	50	2
Boulter, 1997	-.21	0	1	5	1	2	55	2
	.07	0	1	5	1	3	55	2
Brakensiek, 1983	.06	0	3	5	3	0	148	1
Dallager & Rosen, 1993	.45	1	3	7	4	3	145	1
Davis, 1997	.84	0	1	5	2	0	90	2
	.78	0	1	5	2	2	90	2
Duggan, 1998	.25	0	3	6	2	0	339	4
	.00	0	3	6	2	0	339	4
	.00	0	3	6	2	2	339	4
	.22	0	3	6	2	2	339	4
Ensign, 1996	.22	0	4	6	1	1	61	1
Fischer, 1986	.41	1	4	7	4	3	95	9
	.42	1	4	7	4	3	82	9
	.11	1	4	7	4	3	66	9
	.36	1	2	7	4	3	59	9
	-.25	1	2	7	4	3	57	9
	.22	1	2	7	4	3	66	9
	.28	1	3	7	4	3	166	9
	-.02	1	3	7	4	3	164	9
	.09	1	3	7	4	3	138	9
Fonow, Richardson, & Wemmerus, 1992	.10	1	3	2	0	1	323	2
	.10	1	3	6	0	1	327	2
Forst, 1993	.87	0	3	4	1	0	35	4
	.99	0	3	4	1	1	35	4
	.27	0	3	6	—	0	36	4
	.23	0	3	6	—	1	36	4
Foubert & Marriott, 1997	2.14	1	1	6	1	0	45	2
	1.15	1	1	6	1	2	45	2
Foubert & McEwen, 1998	2.10	1	1	6	1	0	59	1
Gibson, 1991	.13	0	2	6	1	2	80	2
	.15	0	4	6	1	2	140	2

Gillies, 1997	-.12	0	1	4	1	0	153	8
	.10	0	1	4	1	1	153	8
	.03	0	1	4	1	0	147	8
	.14	0	1	4	1	1	147	8
	.11	0	1	4	1	0	153	8
	-.08	0	1	4	1	1	153	8
	.20	0	1	4	1	0	147	8
	-.05	0	1	4	1	1	147	8
Harrison, Downes, & Williams, 1991	.97	1	2	2	0	0	7	8
	.70	1	2	5	1	0	10	8
	-.06	1	4	2	0	0	15	8
	.51	1	4	5	1	0	8	8
	1.47	1	2	2	0	0	7	8
	.92	1	2	5	1	0	10	8
	-.10	1	4	2	0	0	15	8
	.27	1	4	5	1	0	8	8
Heppner et al., 1995 <sup>a</sup>	.49	1	2	4	1	0	105	4
	-.16	1	2	4	1	2	105	4
	.67	1	4	4	1	0	152	4
	.26	1	4	4	1	2	152	4
Heppner et al., 1995 <sup>b</sup>	.75	1	2	4	2	0	90	12
	.56	1	2	4	2	1	90	12
	-.16	1	2	4	2	3	63	12
	.48	1	4	4	2	0	82	12
	.52	1	4	4	2	1	82	12
	.42	1	4	4	2	3	66	12
	.39	1	2	6	2	0	84	12
	.25	1	2	6	2	1	84	12
	.06	1	2	6	2	3	63	12
	.38	1	4	6	2	0	90	12
	.40	1	4	6	2	1	90	12
	.06	1	4	6	2	3	74	12
Holcomb et al., 1993	1.39	1	3	6	1	0	331	1
Jensen, 1993	.44	0	3	5	1	0	521	2
	.27	0	3	5	1	2	521	2
Johnson, 1978	1.19	0	1	2	2	0	103	2
	.43	0	1	5	3	1	78	2
Jones & Muehlenhard, 1990	.25	0	3	3	—	1	244 <sup>b</sup>	3
	.25	0	3	3	—	1	244	3
	.25	0	3	3	—	1	244	3
Lanier et al., 1998	.32	1	3	2	1	0	436	1
Layman-Guadalupe, 1996	.24	0	4	5	1	2	74	2
	.26	0	4	1	0	2	62	2
Lee, 1987	2.15	1	1	6	3	0	12	1
Lenihan et al., 1992	.73	1	4	5	1	1	103	2
	-.11	1	2	5	1	1	72	2
Lenihan & Rawlins, 1994	-.11	1	4	5	—	2	113	2
	-.11	1	2	5	—	2	78	2
Lonsway et al., 1998	1.43	1	3	7	4	0	92	2
	.90	1	3	7	4	3	55	2

**TABLE 4. Continued**

Study	Moderator Variable <sup>a</sup>								
	d	1	2	3	4	5	6	7	
Nagler, 1993	.26	0	2	6	3	1	75	4	
	-.76	0	4	6	3	1	51	4	
	.33	0	2	6	3	1	75	4	
	-.03	0	4	6	3	1	51	4	
Nelson & Torgler, 1990	.00	1	3	2	0	0	58	2	
	.00	1	3	1	0	0	56	2	
Nichols, 1991	.18	0	2	3	3	0	15	8	
	.14	0	2	3	3	1	15	8	
	.29	0	4	3	3	0	24	8	
	.55	0	4	3	3	1	24	8	
	.14	0	2	6	3	0	10	8	
	.07	0	2	6	3	1	10	8	
	.42	0	4	6	3	0	20	8	
	.39	0	4	6	3	1	20	8	
	Northam, 1997	.46	0	1	5	1	0	42 <sup>c</sup>	4
		.47	0	1	5	1	3	42	4
.49		0	1	5	1	0	48	4	
.83		0	1	5	1	3	48	4	
Patton & Mannison, 1993	.96	1	3	7	4	3	52	2	
	.85	1	3	7	4	3	34	2	
Pinzone-Glover, Gidycz, & Jacobs, 1998	.87	1	2	5	1	1	59	2	
	.34	1	4	5	1	1	92	2	
Prince, 1994	.11	0	1	5	2	0	34	4	
	.25	0	1	5	2	3	34	4	
	.11	0	2	5	2	0	19	4	
	.31	0	2	5	2	3	19	4	
Rosenthal, Heesacker, & Neimeyer, 1995	.32	1	3	6	1	0	245	1	
Schewe & O'Donohue, 1996	1.23	1	1	2	1	1	22	2	
	.15	1	1	2	1	1	26	2	
Schewe & Shizas, 1999	1.48	0	1	2	1	0	40	3	
	.26	0	1	5	1	0	37	3	
	1.20	0	1	2	1	0	28	3	
Schwartz & Wilson, 1993	.17	1	2	3	1	1	118	2	
	.39	1	4	3	1	1	226	2	
Tarrant, 1997	.47	0	1	3	1	0	144	8	
	.49	0	1	3	1	1	157	8	
	.23	0	1	3	1	0	147	8	
	.28	0	1	3	1	1	159	8	
	.31	0	1	5	1	0	146	8	
	.25	0	1	5	1	1	144	8	
	.22	0	1	5	1	0	149	8	
	.18	0	1	5	1	1	146	8	
Turner, 1996	.21	0	2	6	1	1	86	1	
Williams, 1996	.26	0	5	2	0	0	270	1	

Wolford, 1993	.33	0	2	3	1	2	13	12
	.26	0	2	3	1	3	13	12
	.05	0	4	3	1	2	14	12
	.35	0	4	3	1	3	14	12
	-.31	0	2	2	1	2	11	12
	-.13	0	2	2	1	3	11	12
	.19	0	4	2	1	2	25	12
	.41	0	4	2	1	3	25	12
	.41	0	2	6	1	2	14	12
	-.12	0	2	6	1	3	14	12
	.21	0	4	6	1	2	18	12
	.11	0	4	6	1	3	18	12

<sup>a</sup>Variable 1 (source of data: 0 = dissertation, presentation, or unpublished study, 1 = published study), variable 2 (gender of participants: 1 = men in single-gender groups, 2 = men in mixed-gender groups, 3 = men and women in mixed-gender groups, 4 = women in mixed-gender groups, 5 = women in single-gender groups), variable 3 (intervention type: 1 = brochure, 2 = video or play, 3 = lecture, 4 = video and lecture, 5 = lecture and/or video plus discussion, 6 = workshop or interactive theater, 7 = course), variable 4 (length of intervention: 0 = 30 minutes or less, 1 = between 31 and 60 minutes, 2 = between 61 and 90 minutes, 3 = longer than 90 minutes, 4 = course), variable 5 (follow-up time: 0 = immediately after program, 1 = 1 to 5 weeks, 2 = 6 to 10 weeks, 3 = more than 10 weeks), variable 6 (sample size of comparison), variable 7 (number of comparisons within study).

<sup>b</sup>For Jones and Muehlenhard (1990), the total sample size was 488, however the size of each group was not reported. Because there were four groups and assuming the groups were of equal sizes, the sample size for each group was estimated to be 122.

<sup>c</sup>In Northam's (1997) study, the sample size of each group was not reported. The total sample size was divided by the number of groups in order to estimate the size of each group.

The present results must be viewed with caution since not all rape prevention programs have been evaluated. The majority of programs probably have not been empirically evaluated. The results of this meta-analysis also generalize only to college students. Although some evaluations of programs at the high school level do exist, they were not included here because of possible differences between high school and college students. In addition, some of the studies included here used specialized groups of college students (such as athletes or fraternity members) as their participants, which may have affected results.

Furthermore, a variety of scales were included in this study that were thought to measure similar constructs of rape-supportive attitudes. Although additional analyses demonstrated that results of programs did not differ according to whether the Rape Myth Acceptance Scale (Burt, 1980) or other scales were used, there may be differences among the numerous other scales included. According to Lonsway and Fitzgerald (1994), there is a wide range of content and dimensions of the various measures of rape myth acceptance. Because the psychometric properties of scales measuring rape myth acceptance have been criticized (Lonsway & Fitzgerald, 1994), conclusions offered here are tentative.

In addition, although type of program was included in the meta-analysis, the content of the program was not. However, the contents of rape intervention programs do typically overlap (Breitenbecher, 2000). Some of the aspects often included are: information on the prevalence of sexual assault, challenging rape myths and sex-role stereotypes, identifying risk-related dating behaviors, increasing empathy for rape survivors, effects of rape on victims, common characteristics of victims and offenders, and providing lists of victims' resources (Breitenbecher, 2000; Gidycz, Dowdall, & Marioni, in press). Nonetheless,

because programs cover such a wide variety of constructs, researchers cannot determine which constructs are responsible for the observed effects (Bachar & Koss, in press; Yeater & O'Donohue, 1999).

The findings of this meta-analysis suggest that evaluations of rape prevention programs should include long follow-up times, techniques to improve the stability of attitude change, and ways to reduce demand characteristics. Rape prevention programs also seem to be more effective with single-gender audiences for men in reducing rape-supportive attitudes. Lonsway (1996) stated that the effectiveness of intervention types, presentation materials, and communication styles may differ by gender, however, this has yet to be examined. Rozee and Koss (in press) suggested a gendered approach to rape education involving resistance training for women and prevention training for men, which should be a priority for future research. In addition, the development and use of more behavioral outcome measures in program evaluations need to be a main focus of future research in order to determine if these rape prevention programs and attitude changes are actually decreasing sexual aggression in men. Future research needs to continue to address the primary prevention of sexual assault, with evaluations of these programs as a key focus.

## NOTES

<sup>1</sup>Seven studies were excluded from the present analysis due to insufficient information. Three studies (Berg, Lonsway, & Fitzgerald, 1999; Killian, 1996; O'Neal, 1995) used a post-test only design comparing groups receiving different rape prevention programs. Because they did not include a pre-test or a no-treatment control group, these studies were excluded. Gilbert, Heesacker, and Gannon (1991) combined four scales (Rape Myth Acceptance, Adversarial Sexual Beliefs, Sex Role Stereotyping, and Acceptance of Interpersonal Violence, all developed by Burt [1980]), to form a composite dependent variable of general attitude change, therefore the effect of the program on reducing only rape myth acceptance could not be assessed. Similarly, Heppner and colleagues' (1999) study was excluded because the researchers conducted analyses with a "Rejection of Rape" scale created from five different dependent variables, only two of which assessed rape attitudes. Although Murphy (1997) included Burt's (1980) Rape Myth Acceptance Scale as a dependent variable, all analyses were conducted using each group that viewed a program ( $N = 9$ ), rather than each participant, as the unit of analysis. Therefore, comparable results (means and standard deviations) could not be extracted from this study. Earle (1996) used factor analysis on the Attitudes Toward Rape Scale (Barnett & Feild, 1977) to create factors for use as the dependent variables. Because analyses only included a small portion of the Attitudes toward Rape Scale (six items), this study was excluded.

<sup>2</sup>One exception to this was the dissertation of Forst (1993). The published article (Forst, Lightfoot, & Burrichter, 1996) based on this dissertation compared the effects of the program in terms of participants' familiarity with sexual assault victims and/or offenders. Forst's (1993) dissertation included the means and standard deviations for the dependent variables of the treatment and control groups as a whole, which were used to calculate the effect sizes in this study.

<sup>3</sup>For Fonow, Richardson, and Wemmerus (1992), the  $d$  statistic was imputed as .10 for a weak effect. The authors stated that there was a significant difference between groups, but upon examining the means, it was apparent to us that the difference between means was weak. In addition, standard deviations were not given along with the means, therefore  $t$ -tests could not be computed.

<sup>4</sup>Only one comparison examined the attitude change of women in a single-gender group, therefore this comparison was not included in the dummy coding for gender.

<sup>5</sup>Because 12 comparisons (all human sexuality courses) did not specify when the follow-up test was given, it was assumed that they took place more than 10 weeks after the intervention began.

<sup>6</sup>An additional variable was created in order to compare results of studies using the Rape Myth Acceptance Scale (Burt, 1980) with studies using other attitudinal scales. Fifty-four percent of comparisons used Burt's Rape Myth Acceptance Scale. When this variable was included in the linear regression model, it was not significantly related to effect size. There were also no changes in the significance level of the other moderator variables.

<sup>7</sup>A regression model comparing women in single-gender and mixed-gender groups could not be conducted due to only one study targeting women in a single-gender audience.

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