

EVALUATION OF A SEXUAL ASSAULT RISK REDUCTION AND SELF-DEFENSE PROGRAM: A PROSPECTIVE ANALYSIS OF A REVISED PROTOCOL

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The current study extends the development and evaluation of an existing and previously evaluated sexual assault risk reduction program with a self-defense component for college women ($N = 300$). The program protocol was revised to address psychological barriers to responding assertively to risky dating situations, and a placebo-control group was utilized rather than a wait-list control group. Relative to the placebo-control group, the program was effective in increasing levels of self-protective behaviors, self-efficacy in resisting against potential attackers, and use of assertive sexual communication over a 4-month interim. Results also suggested reduction of incidence of rape among program participants over the 2-month follow-up. Implications for future development and evaluation of sexual assault risk reduction programming are presented.

Despite the widely documented rates of sexual victimization on college campuses (e.g., Fisher, Cullen, & Turner, 2000; Koss, Gidycz, & Wisniewski, 1987), the prevalence of sexual assault has remained relatively stable over the past decade (Roze & Koss, 2001). Efforts to reduce rates of sexual victimization are of extreme concern for psychologists and health officials given the strong connection between sexual victimization and health care costs (Koss, Woodruff, & Koss, 1991), substance use (Ullman & Brecklin, 2003), and a host of psychological symptomatology (e.g., Aciermo, Resnick, & Kilpatrick, 1997; Thompson et al., 2003). In fact, U.S. federal law mandates that all colleges and universities that receive federal funding implement some type of

sexual assault prevention program (National Association of Student Personnel Administrators, 1994).

Over the past three decades, researchers and social advocates have developed a range of educational interventions and awareness campaigns to combat rates of sexual victimization on college campuses (for reviews, see Bachar & Koss, 2000; Gidycz, Rich, & Marioni, 2002). Prevention programs take an array of forms, including educational programming with criminal justice agencies to improve service provision to victims (Littel, 2001), bystander interventions to empower individuals to intervene when they witness potentially threatening dating situations (Banyard, Plante, & Moynihan, 2004; Banyard, Moynihan, & Plante, 2007), and empathy-based or skills-based programming to decrease men's and women's risk for perpetrating or experiencing sexual victimization (for a review, see Breitenbecher, 2000). However, the vast majority of programs lack a theoretical conceptualization as well as quantitative and longitudinal evaluation of program effectiveness (McCall, 1993; Yeater & O'Donohue, 1999).

Further, the vast majority of published outcome data on sexual assault prevention programming refers to programming for mixed-sex audiences (e.g., Heppner, Humphrey, Hillenbrand-Gunn, & DeBord, 1995; Lonsway, 1996). Whereas participants involved in mixed-sex programming have demonstrated decreases in rape myth acceptance over short-term follow-up periods (e.g., Anderson et al., 1998; Heppner, Good et al., 1995; Heppner, Humphrey et al., 1995; Pinzone-Glover, Gidycz, & Jacobs, 1998; Rosenthal, Heesacker, & Neimeyer, 1995), these changes are generally

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not maintained (Anderson et al., 1998; Heppner, Good et al., 1995; Heppner, Humphrey et al., 1995). Although a smaller number of mixed-sex programs have demonstrated favorable results increasing participants' behavioral intent (i.e., likelihood to use risk reduction strategies or contribute to sexual assault prevention efforts; Lonsway & Kothari, 2000; Lonsway et al., 1998; Rosenthal et al., 1995), these studies failed to examine the relationship between program participation and rates of sexual victimization or perpetration, making it unclear if the program was related to decreases in rates of sexual assault. A Gidycz, Layman et al. (2001) study of mixed-sex programming examined the program's effect on rates of sexual victimization; however, results suggested that program participation was not associated with rates of victimization or perpetration among women or men, respectively.

Despite the prevalence of mixed-sex sexual assault prevention programs, experts in the field of sexual assault prevention have identified a number of shortcomings with programming for mixed-sex audiences. As Gidycz and her colleagues (2002) posit, some of the topics of mixed-sex programming that are geared towards reducing women's risk of assault may be unethical topics for discussion, as they could provide potential perpetrators with information regarding women's resistance strategies. Furthermore, the goals of sexual assault prevention programming for men and sexual assault risk reduction programs do not overlap, which makes it unlikely that a mixed-sex program will be personally relevant to both sexes (Gidycz et al., 2002; Gidycz, Loh, & Rich, 2003).

Although true prevention of sexual violence is achieved through work with potential perpetrators, sexual assault risk reduction programs for women operate under the belief that women can be more effective in resisting against potential attackers when they are skilled in detecting the cues that a situation is moving toward a potentially threatening dating situation (Gidycz et al., 2002; Rozee & Koss, 2001). Risk reduction programs for women aim to enable participants to assess whether a dating situation is potentially dangerous, acknowledge when a situation is dangerous and label it as such, and then take assertive and forceful action (i.e., forceful verbal responses, immediate physical resistance; Nurius & Norris, 1995; Rozee & Koss, 2001). Programs also aim to increase women's use of overt physical responses to potential threats by helping women to anticipate risk and to utilize an increasingly more assertive hierarchy of verbal and physical resistance once a potential threat is detected (Rozee & Koss, 2001). Because some instances of sexual victimization are unavoidable, developers of risk reduction programs for women must ensure that program content does not have the iatrogenic effect of increasing women's feelings of self-blame or guilt for experiences of sexual assault (Breitenbecher, 2000). Therefore, a further objective of risk reduction programming is to indirectly assist in the recovery process by decreasing self-blame in women who experience sexual victimization (Gidycz et al., 2002).

The most comprehensive research and development of sexual assault risk reduction programming for women has been conducted by Gidycz and her colleagues, who have worked for over a decade to systematically develop and evaluate a sexual assault risk reduction program for women (i.e., Breitenbecher & Gidycz, 1998; Gidycz, Lynn et al., 2001; Gidycz, Rich, Orchowski, King, & Miller, 2006; Hanson & Gidycz, 1993). In the most recent program evaluation, Gidycz et al. (2006) utilized a sample of 500 college women to examine the effectiveness of the risk reduction program. Through the addition of a self-defense workshop, a booster session review of program material, and a video entitled "Keep Your Options Open: Alternate Solutions for Stressful Social Situations" (Gidycz, 2000), the length of the risk reduction program was increased to a total of 7 hours. Although the program was not effective in reducing rates of sexual victimization, women who participated in the program reported significant increases in self-protective behaviors, and women who were victimized during the 2-month follow-up period reported less self-blame compared to a wait-list control group (Gidycz et al., 2006).

Gidycz et al. (2006) suggest that sexual assault risk reduction programs may benefit by increased discussion of psychological barriers to resistance that women encounter that make it difficult for them to implement risk reduction strategies that are modeled in the program. For example, cultural dating norms while on a date (i.e., wanting to be liked, wanting to make a good impression) make it likely that women attend to the social cues present in the situation rather than to potential safety cues (Nurius, 2000). Psychological barriers to acting assertively (e.g., embarrassment, rejection) make it even more likely that the subtle cues that a dating situation is potentially threatening are normalized and therefore ignored (Norris, Nurius, & Dim-eff, 1996; Norris, Nurius, & Graham, 1999; Nurius, 2000; Nurius & Norris, 1995). Given women's tendency to underestimate their risk for acquaintance assault (Hickman & Muehlenhard, 1997), it is likely that women may perceive the drawbacks of responding assertively in risky dating situations to outweigh the benefits of prioritizing personal safety (Nurius, 2000). As such, coaching women in how to overcome potential psychological barriers is a valuable strategy for increasing women's effectiveness in responding to potentially threatening dating situations (Breitenbecher & Scarce, 2001; Norris et al., 1996; Norris et al., 1999; Nurius, 2000; Nurius & Norris, 1995).

Combs-Lane and Smith (2002) suggested that intent to engage in risk reduction behaviors may also be an important component to active resistance to threat. Factors such as high levels of confidence, fear of injury, and feelings of being isolated or controlled are associated with use of both verbally and physically assertive resistance against unwanted sexual experiences (Gidycz, VanWynsberghe, & Edwards, *in press*; Turchik, Probst, Chau, Nigoff, & Gidycz, 2007).

The purpose of the current study was to evaluate a modified version of the existing Ohio University Sexual Assault

Risk Reduction Program (Gidycz et al., 2006). The revised program maintained the use of a self-defense component, all video segments, and the booster session review of program material. The modified risk reduction program maintained its focus on the use of the health belief model, the elaboration likelihood model, and social learning theory. However, consistent with the socio-ecological model, the modified program also addressed psychological barriers to resistance (i.e., Norris et al., 1996; Norris et al., 1999; Nurius, 2000; Nurius & Norris, 1995) and intentions to engage in risk reduction behavior (Ajzen, 1985, 1987, 1991; Combs-Lane & Smith, 2002), as supported by a recent study in which women's intentions to use active resistance strategies prior to their assault predicted their actual use of these strategies (Gidycz et al., in press). Given that the comparison of treatment groups to a nontreatment control group is often noted as a methodological concern in the field of psychotherapy research (e.g., Ogles, Lambert, & Fields, 2002), the present study utilized a placebo-control group rather than a wait-list control group.

Program evaluation included both a 2-month and a 4-month follow-up assessment, allowing for the examination of changes in rates of sexual victimization and engagement in risk reduction behaviors as a function of program participation. We also explored whether women with a previous history of sexual victimization responded differently to the program protocol. It was hypothesized that women who participated in the risk reduction program, relative to the placebo-control group, would demonstrate higher levels of self-protective behavior, assertive sexual communication, self-efficacy in resisting against potential threats, knowledge of sexual assault, and lower rates of sexual victimization over a 4-month follow-up period.

METHOD

Participants

Participants were 301 undergraduate women enrolled in psychology courses at a medium-size Midwestern university. Participants volunteered for the study via an online experimental sign-up system. The study was advertised as a study of educational programming for women, and participants were informed that they would be asked to discuss health behaviors, social experiences, and dating behaviors. After volunteering for the study, none of the women declined to participate or withdrew from the study. All program sessions were conducted in classrooms in the Department of Psychology. Due to missing data, the responses from one participant were deleted prior to statistical analyses, resulting in a total of 300 participants.

The majority of participants were first- or second-year students (95%), 18 or 19 years old (91.7%), and identified as nonmarried (100%) and heterosexual (98.7%). Ninety-six percent of the women self-identified as Caucasian ($n = 287$), 3% as African American ($n = 10$), 0.3% as Asian

American ($n = 1$), and 0.7% listed as other ($n = 2$). Over one third of participants reported that they did not know their annual family income ($n = 95$), 13% of the women reported annual family incomes that were \$50,000 or less ($n = 49$), 20% reported their annual family income to be between \$50,000 and \$100,000 ($n = 89$), and 26% reported their annual family income to be over \$100,000 ($n = 77$). Eight percent ($n = 25$) reported previous participation in a sexual assault risk reduction program and 13.7% ($n = 41$) reported previous participation in a self-defense program.

Experiences of adolescent sexual victimization (i.e., unwanted sexual experiences from the age of 14 to the pretest assessment) were reported by 39.3% ($N = 118$) of the participants. Specifically, experiences of moderate sexual victimization (i.e., an unwanted sexual experience other than rape, including attempted rape, sexual coercion, or forced sexual contact) were reported by 27.3% ($n = 82$) of the participants. Experiences of severe sexual victimization (i.e., rape) were reported by 12% of the participants ($n = 36$). Analyses revealed no significant differences between program and control participants in age, ethnicity, academic rank, family income, past participation in a sexual assault risk reduction program or self-defense course, or history of sexual victimization. Analyses were also conducted to explore baseline differences on program outcome measures. Results suggested that program participants reported significantly higher levels of self-protective dating behaviors compared to control group participants at the baseline assessment.

The placebo-control group protocol was entitled "A Peer-Based Vaccine Preventable Disease Education and Awareness Program" (Auble, Goldberg, Kinor, Reese, & Raffle, 2004). Vaccine-preventable diseases was selected as the topic of the control group intervention following a literature search revealing a dearth of health interventions on vaccine preventable diseases specifically tailored to college women or college students in general (Raffle et al., 2005). Due to the association of sexual victimization with a variety of health risk behaviors (Brener, McMahon, Warren, & Douglas, 1999; Gidycz, Orchowski, King, & Rich, in press), the content of the placebo-control group intervention was designed such that it did not overlap with the content of the risk reduction program. Focus groups and a pilot study were utilized to assess the clarity and appropriateness of program material. The placebo-control group intervention was of equal length to the risk reduction program and also incorporated video segments, a PowerPoint presentation, facilitated discussions, and a booster session review of program material.

Sexual Assault Risk Reduction Program

Program revisions. Drawing from empirical analyses of past programming efforts, as well as theoretical models of attitude and behavior change, the current program revisions aimed to more comprehensively address the barriers to engaging in self-protective behaviors against sexual

victimization. The theories that were utilized in previous evaluations of the sexual assault risk reduction program were also incorporated into the revised protocol. Specifically, the sexual assault risk reduction program protocol utilizes social learning theory (Bandura, 1977), which suggests that individuals learn by observing and imitating others, as well as the health belief model (Hochman, 1958), which suggests that individuals' health-related actions are related to the perceived susceptibility and severity of health-consequences, as well as the perceived benefits and barriers of engaging in protective behavior.

The elaboration likelihood model (Petty & Cacioppo, 1981, 1986) is also utilized in the program protocol with the goal of increasing the saliency and personal relevancy of program material. According to the elaboration likelihood model, long-term and stable attitude and behavior change is associated with central route processing, which occurs when individuals attend to personally relevant messages rather than general, less salient information (i.e., peripheral route processing). The protocol therefore utilizes statistics from the local university to provide more personally relevant messages to women. Finally, the feminist self-defense course, booster session review of program material, and revised video presentations utilized in the previous evaluation of the program protocol (i.e., Gidycz et al., 2006) were also included in the current protocol.

Program protocol was modified to more comprehensively address two components: (a) psychological barriers to resistance and (b) intentions to engage in self-protective behavior. Overall, reducing one's risk for sexual victimization was presented as a lifestyle, which might require some women to change how they currently perceive dating situations, make a plan for how they will respond to risky dating situations, and prioritize their personal safety over potential social consequences. First, given research suggesting the potential mediating role of cognitive appraisals in women's process of risk detection and assertive response to threat, the program protocol was modified to more comprehensively address potential barriers to resistance (i.e., Norris et al., 1996; Norris et al., 1999; Nurius, 2000; Nurius & Norris, 1995; Rozee & Koss, 2001). Specifically, consistent with the socio-ecological model, the protocol was revised to include discussion of women's personal beliefs about potential benefits and drawbacks to reacting assertively and how they might talk themselves out of engaging in self-protective behavior when they prioritize social demands over personal safety. The program was also revised to include discussion of the overlap between events leading to sexual victimization by an acquaintance and the components of normal dating situations, such as the role of social alcohol use and sexual advances by a date (i.e., Norris et al., 1999). The potential social consequences (e.g., embarrassment, rejection) that sometimes underlie women's hesitancy to engage in self-protective strategies were also discussed.

Second, consistent with the theory of planned behavior (Ajzen, 1985, 1987, 1991), the program protocol was modified to address women's intention to engage in self-

protective dating behaviors. The program protocol was revised to address women's ability to foresee involvement in risk-taking and risk reduction behaviors prior to engaging in them (Combs-Lane & Smith, 2002; Gray, Lesser, Quinn, & Bounds, 1990). The importance of making a plan to respond assertively and taking a protective stance when in social situations was discussed as a specific strategy that women could employ to reduce their risk of harm. Focus groups were utilized to examine the usefulness of the program revisions, and participants reported that the revised language and theoretical integrations to the program were beneficial.

Program protocol. Consistent with previous program evaluation, the specific goals of the program were (a) to reduce the incidence of sexual assault among program participants over the 2-month and 4-month interim, (b) to increase women's recognition of risky dating situations, (c) to increase women's use of self-protective dating behaviors, (d) to increase women's use of assertive sexual communication, (e) to increase women's self-efficacy in responding to potentially threatening dating situations, (f) to decrease feelings of self-blame among women who experience sexual victimization, (g) to provide women with information regarding recovery from sexual victimization, and (h) to provide women with information regarding resources to utilize following experiences of sexual victimization.

The program consists of three components: (a) an initial didactic and interactive course, (b) a feminist self-defense course, and (c) a booster session review of program material. The first session begins with a PowerPoint presentation, which leads to a discussion of the societal factors that underlie violence against women. The program emphasizes that, although the perpetrators of violence are always responsible for sexually aggressive acts, there are strategies women can use to reduce their risk of being victimized. Statistics relating to the incidence of sexual victimization on college campuses are provided, including statistics for the local university.

Women next view a video entitled "I Thought It Could Never Happen to Me" (Gidycz, Dowdall, Lynn, Marioni, & Loh, 1997). During the video, college women discuss their experiences of sexual victimization and program participants are instructed to listen for risk factors that the women mention when telling their stories. Following the video, the facilitator leads a large group discussion of the video material in which characteristics of potential perpetrators are highlighted. Women next brainstorm risk factors for sexual victimization, and the facilitator emphasizes that the cues that a dating situation is moving from a normal to threatening dating situation are often quite ambiguous. Women's perceptions of the role of alcohol as a specific risk factor for sexual victimization along with the role of date rape drugs are also discussed in the large-group format. The facilitator then provides information regarding the process of recovery from sexual victimization.

The first session concludes with an interactive video entitled “Keep Your Options Open: Alternative Solutions for Stressful Social Situations” (Gidycz, 2000) that presents strategies women can employ when faced with potentially threatening dating situations. After viewing an initial presentation of each scenario, the facilitator stops the tape to allow the participants to discuss the risk factors involved and potential responses women can use. The video presentation proceeds by showing potential responses to the risky situation, and participants are encouraged to identify the barriers and benefits to engaging in each response. Participants are encouraged to brainstorm reasons why women tend to dismiss potential risk cues when in dating situations, and the facilitator provides information regarding the benefits for having a plan about how to respond when in a risky situation.

The second portion of the risk reduction program consists of a 2-hour feminist self-defense course, which addresses a range of verbal and physical responses to threatening dating situations. Participants attended the course within 2 weeks of attending the first session. Assertive verbal responses and physical defense tactics are modeled by a female self-defense instructor and then practiced by program participants. For example, participants are encouraged to develop an awareness of their body language and utilize assertive sexual communication by noting sexual activities in which they do and do not want to engage. Each physical resistance technique is practiced individually, as well as in combination with other techniques. At the close of the program, women are reminded of the importance of trusting their intuition and responding quickly and assertively once they acknowledge a threatening dating situation. The third portion of the program consists of a 1-hour review of program material, as well as a discussion of how women applied the strategies learned in the self-defense program. Participants attended the booster session approximately 2 months after initial program participation.

A female graduate student researcher facilitated the program groups. A female undergraduate student researcher was present to assist with facilitation of the PowerPoint presentation and video clips. The assistant facilitator was also available to assist with program discussion when necessary (i.e., provide additional comments not discussed by program participants, engage in dialogue with the facilitator to address questions). A faculty advisor was available to supervise program facilitation. Program groups consisted of approximately 5–15 women.

Outcome Measures

Sexual victimization. Adolescent sexual victimization and sexual victimization over the follow-up periods was assessed through the Sexual Experiences Survey (Koss & Oros, 1982). The Sexual Experiences Survey utilizes a series of 10 sexually explicit questions that assess past sexual behavior along a variety of dimensions. Individuals were placed into categories of sexual victimization history

according to the most severe experience reported, including (a) *no history of sexual victimization* (i.e., no items were endorsed), (b) *moderate sexual victimization* (i.e., items were endorsed referring to unwanted sexual experiences other than rape, including attempted rape, sexual coercion, and forced sexual contact), and (c) *severe sexual victimization* (i.e., rape; threats of force or physical force were used to coerce the woman into engaging in oral, anal, or vaginal intercourse). Both Gylys and McNamara (1996) and Koss and Gidycz (1985) reported that the Sexual Experiences Scale demonstrates good reliability and validity. Cronbach's alpha for the scale was .70 for the current sample.

Self-protective dating behavior. Participants' use of protective strategies against sexual victimization was assessed with the Dating Self-Protection Against Rape Scale (Moore & Waterman, 1999). Participants report the frequency with which they engage in a series of 15 behaviors used to protect themselves from sexual victimization (i.e., “How often do you pay attention to your dating partner's drug/alcohol intake?”). Responses are provided along a 6-point scale, ranging from *never* to *always*, whereby higher scores indicate more frequent use of self-protective behavior. Moore and Waterman (1999) reported that the scale demonstrates good internal consistency (Cronbach's alpha = .86) and good split-half reliability (Spearman-Brown = .81). Cronbach's alpha for the scale was .86 for the current sample.

Assertive sexual communication. Participants' use of assertive sexual communication in dating situations was assessed by the Sexual Communication Survey (Hanson & Gidycz, 1993). Participants report the frequency with which they engage in open sexual communication with their partner regarding a range of topics, such as sexual likes and dislikes (i.e., “Do you ever end up allowing a guy that you go out with to kiss you when you don't really want to, not because you feel forced or coerced, but because of some other concern [such as wanting him to like you or being too embarrassed to talk about it]?”). Responses are provided along a 7-point scale, ranging from *never* to *always*. The measure was reverse scored, such that higher scores indicate greater use of open sexual communication. Breitenbecher and Gidycz (1998) reported that the scale has a Cronbach's alpha of .99 and a 2-month test-retest reliability of .60. Compared to women without a history of sexual victimization, women with a history of sexual victimization report less assertive sexual communication on the Sexual Communication Survey (Breitenbecher & Gidycz, 1998). Cronbach's alpha for the scale was .90 for the current sample.

Self-efficacy. Participants' confidence in utilizing assertive responses to potentially threatening dating situations was assessed by seven items on the Self-Efficacy Scale (i.e., “If a man you were with was attempting to get you to have sex with him and you were not interested, how confident are you that you could successfully resist his advances?”; Marx, Calhoun, Wilson, & Meyerson, 2001; Ozer & Bandura, 1990).

Responses are provided along a 7-point scale, ranging from *not at all confident* to *very confident*. The scale demonstrates good internal consistency reliability (Cronbach's alpha = .97; Ozer & Bandura, 1990) and Calhoun and her colleagues (2001) suggested that the measure is useful in assessing women's confidence to respond assertively to potential threat. In the current sample, Cronbach's alpha for the scale was .80.

Attributions of blame following sexual victimization. Participants' attributions of blame following experiences of sexual victimization over the 2-month and 4-month follow-up were assessed by 25 items on the Rape Attribution Scale (Frazier, 2002; Frazier & Seales, 1997). Responses are provided along a 5-point scale, ranging from *never* to *very often*, whereby higher scores indicate higher levels of blame. Five subscales were utilized to explore various attributions of blame, including (a) societal blame, (b) behavioral self-blame, (c) characterological self-blame, (d) chance, and (e) rapist blame. The scale demonstrates good internal consistency reliability (i.e., Frazier, 1990; Frazier, 2002). Among the current sample of women experiencing sexual victimization over the 2-month follow-up, Cronbach's alpha for the subscales ranged between .65 and .91.

Knowledge measure. Participants' knowledge of sexual assault and risk factors for sexual victimization were assessed through the Ohio University Sexual Assault Risk Reduction Program Knowledge Measure. The measure contains 30 multiple-choice, true-false, and short answer questions, which are specifically keyed to material discussed in the sexual assault risk reduction program. Scores range between 0 and 30 and higher scores are indicative of greater accuracy.

Resistance tactics. At the 4-month follow-up, a set of questions was provided to participants in both the program group and the placebo-control group to examine how women's use of self-protective strategies and self-defense tactics differed as a function of program participation. Specifically, women indicated their use of six self-defense strategies over the 4-month follow-up period by responding either "yes" or "no" to the question prompt. The self-defense strategies assessed included (a) assertive body language (e.g., walking confidently), (b) assertive verbal responses (e.g., saying "no"), (c) avoiding telegraphing emotions (e.g., providing an assertive verbal response even when nervous), (d) attention to your intuition (e.g., trusting your gut), (e) yelling and running, and (f) physical self-defense. Importantly, each of these six forms of resistance to potentially threatening dating situations were discussed, modeled, and rehearsed during the self-defense program.

Procedure

Data were collected at a pretest, 2-month follow-up, and 4-month follow-up over the course of one academic year.

Women received extra-credit points toward their Introductory Psychology course requirements for participating in the pretest and 2-month follow-up assessment. Participation in the 4-month follow-up was voluntary. Upon arriving at the session, women were randomly assigned to either the program group ($n = 157$) or the placebo-control group ($n = 143$). After random assignment, participants in both the program or placebo-control group completed demographic questionnaires; measures of sexual victimization experiences since the age of 14; and measures assessing social, dating, and health-related attitudes and behaviors. At the 2-month and 4-month follow-up, women again completed outcome measures and completed the Sexual Experiences Survey with reference to experiences of sexual victimization over the interim. Program participants engaged in the booster session immediately following completion of the outcome measures at the 2-month follow-up. Participants in both groups completed outcome measures at the 4-month follow-up only.

Return Rates Over the 2-Month and 4-Month Follow-Up

Of the 300 women who participated in the pretest assessment, 88% ($n = 264$) participated in the 2-month follow-up. Of these women, 51.8% ($n = 137$) completed the 4-month follow-up assessment. A series of analyses were conducted to characterize the sample of women who did not return for the 2-month and 4-month follow-up. The purpose of these analyses was to examine whether women who did not return for the follow-up session in the program group differed from women who did not return for the follow-up in the placebo-control group. Chi-square analyses suggested that, among participants who did not return for the 2-month follow-up, women's history of sexual victimization did not differ between program and placebo-control group participants. Further, among the participants who did not return for the 4-month follow-up, sexual victimization over the 2-month follow-up did not vary between program and placebo-control participants. Thus, history of victimization or victimization over the follow-up did not vary between women in the program or placebo-control group who dropped out of the study.

A second series of chi-square analyses were conducted to examine if history of sexual victimization and sexual victimization over the 2-month follow-up varied between women who dropped out and women who remained in the study. For both groups, history of sexual victimization did not vary between women who dropped out and women who remained in the study at the 2-month follow-up or the 4-month follow-up. Additionally, for both groups, sexual victimization over the 2-month follow-up did not vary between women who dropped out and women who remained in the study at the 4-month follow-up.

To further characterize the sample of women who did not return for the follow-up sessions, a series of univariate analyses of variance were conducted to explore how women's baseline levels of self-protective dating behavior,

sexual communication, and self-efficacy in resisting against potential attackers differed between program and control group women who did not return for the 2-month follow-up. Differences between women who dropped out of the study and women who returned for the 2-month follow-up in each group were also examined. Results suggested that women in the program group who did not return for the 2-month follow-up reported significantly lower levels of assertive sexual communication at baseline ($M = 119.13$, $SD = 15.67$) compared to women in the placebo-control group ($M = 131.67$, $SD = 8.66$) who did not return for the 2-month follow-up, $F(1, 30) = 5.08$, $p < .05$. Additionally, in the program group, women who did not return for the 2-month follow-up evidenced significantly lower levels of assertive sexual communication ($M = 119.13$, $SD = 15.67$) compared to women who returned for the 2-month follow-up ($M = 126.06$, $SD = 13.98$), $F(1, 151) = 4.59$, $p < .05$.

A second set of univariate analyses of variance were conducted to examine how self-protective behaviors, sexual communication, and self-efficacy in resisting against potential attackers as reported at the 2-month follow-up differed between program and placebo-control group women who did not return for the 4-month follow-up. Differences between women who dropped out of the study and women who returned for the 4-month follow-up in each group were also examined. Results suggested that, among the women who dropped out of the study at the 4-month follow-up, the program group women reported significantly higher levels of self-protective behavior at the 2-month follow-up ($M = 52.47$, $SD = 11.90$) compared to the women in the placebo-control group ($M = 46.97$, $SD = 12.98$), $F(1, 138) = 7.47$, $p < .05$. Results also suggested that, among the women who dropped out of the study at the 4-month follow-up, the program group women who did not return reported significantly higher levels of self-efficacy at the 2-month follow-up ($M = 39.76$, $SD = 6.31$) compared to the women in the placebo-control group ($M = 37.61$, $SD = 6.29$), $F(1, 138) = 4.07$, $p < .05$. Additionally, for program and control group participants, levels of self-protective behavior, assertive sexual communication, and self-efficacy in resisting against potential attackers at the 2-month follow-up did not vary between women who dropped out of the study and women who returned for the 4-month follow-up.

RESULTS

Program Effects: Self-Protective Dating Behaviors, Assertive Sexual Communication, Self-Efficacy, and Knowledge

Four $2 \times 3 \times 3$ (Group \times Victimization During the 2-Month Follow-up \times Time) repeated measures of analyses of variance were conducted to assess whether program participation was associated with increased levels of self-protective dating behaviors, assertive sexual communication, self-efficacy in resisting against potential attackers, and

knowledge of risk factors for sexual victimization over the 4-month follow-up. Sexual victimization over the 2-month interim was included as an independent variable in the analyses because participants' reports on these scales may be influenced by experiences of sexual victimization over the interim. The Holm (1979) procedure was utilized to control for inflations in family-wise error across the series of analyses of variance. To examine significant main effects, post hoc analyses explored all possible pairwise comparisons utilizing Cicchetti's extension of Tukey's Least Significant Difference test (Cicchetti, 1972). Descriptive statistics for all outcome variables are provided in Table 1. Correlations between outcome variables are presented in Table 2.

Self-protective dating behaviors. The measure of self-protective dating behavior revealed a significant main effect for group, $F(1, 115) = 7.29$, $p < .01$, $\eta_p^2 = .06$. Specifically, participants in the placebo-control group reported overall lower levels of self-protective behaviors ($M = 44.98$, $SE = 1.53$) compared to participants in the program group ($M = 52.16$, $SE = 2.18$). A significant interaction was also revealed between program participation and self-protective dating behaviors over time, $F(2, 230) = 4.97$, $p < .01$, $\eta_p^2 = .04$. Participants in the placebo-control group evidenced decreases in self-protective behaviors from pretest ($M = 47.67$, $SD = 10.74$) to the 4-month follow-up assessment ($M = 44.68$, $SD = 11.69$). Analysis of treatment group participants revealed that levels of self-protective behaviors increased between pre-test ($M = 52.15$, $SD = 9.87$) and the 2-month follow-up ($M = 55.13$, $SD = 12.31$) and were maintained over the 4-month follow-up ($M = 55.55$, $SD = 11.96$). Analyses revealed no other significant differences of measures of self-protective behavior.

Assertive sexual communication. The measure of assertive sexual communication revealed a significant time by group interaction, $F(2, 214) = 3.56$, $p < .05$, $\eta_p^2 = .03$. Among participants in the placebo-control group, levels of assertive sexual communication remained stable from pretest ($M = 125.52$, $SD = 12.90$) to the 2-month follow-up ($M = 126.47$, $SD = 13.73$) and to the 4-month follow-up ($M = 125.75$, $SD = 20.08$). Among program participants, levels of assertive sexual communication increased from the pretest ($M = 125.34$, $SD = 12.91$) to the 4-month follow-up ($M = 130.08$, $SD = 12.84$). Analyses revealed no other significant differences of measures of assertive sexual communication.

Self-efficacy. The measure of self-efficacy in resisting against potentially threatening dating situations revealed a significant time by group interaction, $F(2, 238) = 3.20$, $p < .05$, $\eta_p^2 = .03$. Specifically, among participants in the placebo-control group, levels of self-efficacy were maintained from pretest ($M = 36.44$, $SD = 5.93$) to the 2-month follow-up ($M = 36.75$, $SD = 6.05$) and the 4-month follow-up ($M = 36.90$, $SD = 6.50$). Among program participants,

Table 1
Self-Protective Behavior, Assertive Sexual Communication, Self-Efficacy, and Knowledge of Sexual Assault

Group	Pre-test		2-month		4-month	
	M	SD	M	SD	M	SD
	<u>Self-Protective Behavior^a</u>					
Exp (N = 55)	52.15	9.87	55.13	12.31	55.55	11.96
Con (N = 66)	47.67	10.74	45.98	10.51	44.68	11.69
	<u>Assertive Sexual Communication^b</u>					
Exp (N = 53)	125.34	12.91	125.25	20.17	130.08	12.84
Con (N = 60)	125.52	12.10	126.47	13.73	125.75	20.08
	<u>Self-Efficacy^c</u>					
Exp (N = 57)	37.28	7.15	39.60	5.89	40.65	5.69
Con (N = 68)	36.44	5.93	36.75	6.05	36.90	6.50
	<u>Knowledge^d</u>					
Exp (N = 59)	23.56	1.86	23.92	5.01	24.66	2.67
Con (N = 68)	23.51	2.28	23.90	2.19	23.60	4.16

Note: Exp = Experimental Group; Con = Control Group.

^aScores on the Dating Self-Protection Against Rape Scale range between 15 and 90.

^bScores on the Sexual Communication Survey range between 21 and 147.

^cScores on the Self-Efficacy Scale range between 7 and 49. ^dScores on the Knowledge Measure range between 0 and 30.

Table 2

Correlations Among Outcome Variables at Pretest

Variable	Protect ^a	Efficacy ^b	Knowledge ^c
Communication ^d	.01	.28*	-.05
Protect ^a	–	.11	.10
Efficacy ^b	–	–	-.01

^aDating Self-Protection Against Rape Scale; ^bSelf-efficacy Scale; ^cKnowledge Measure; ^dSexual Communication Survey.

* $p < .001$.

levels of self-efficacy increased from pretest ($M = 37.28$, $SD = 7.15$) to the 2-month follow-up ($M = 39.60$, $SD = 5.89$), and gains were maintained over the 4-month follow-up ($M = 40.65$, $SD = 5.69$). Self-efficacy scores among program participants were significantly higher than those of the placebo-control group at both the 2-month and 4-month follow-up.

Analyses also revealed a significant three-way interaction between time, group, and sexual victimization over the 2-month interim, $F(4, 238) = 3.65$, $p < .01$, $\eta_p^2 = .06$. For each group, pairwise comparisons were conducted to examine how levels of self-efficacy varied over time for women who experienced either none, moderate, or severe sexual victimization over the 2-month interim. Self-efficacy did not vary over time for women in the program group who experienced none or severe sexual victimization. However, program participants who experienced moderate sexual victimization over the 2-month follow-up reported increases in self-efficacy from the pretest ($M = 34.87$, $SD = 8.32$) to the 2-month follow-up ($M = 38.47$, $SD = 6.30$) and 4-month

follow-up ($M = 41.13$, $SD = 4.84$). Similarly, self-efficacy did not vary over time for women in the placebo-control group who experienced none or severe sexual victimization over the 2-month interim. However, women in the placebo-control group who experienced moderate sexual victimization over the 2-month follow-up reported significant decreases in self-efficacy from the pretest ($M = 36.30$, $SD = 4.55$) to the 4-month follow-up ($M = 32.60$, $SD = 6.31$).

Pairwise comparisons were next conducted to examine how, at each assessment, self-efficacy varied between program and control group women who experienced similar forms of sexual victimization over the 2-month interim. At the pretest assessment, levels of self-efficacy did not vary between program and control group women who experienced none, moderate, or severe sexual victimization over the 2-month interim. However, at the 2-month assessment, women in the program group who reported no experiences of sexual victimization over the 2-month interim reported higher levels of self-efficacy ($M = 40.33$, $SD = 5.83$) compared to women in the placebo-control group who reported no experiences of sexual victimization over the 2-month interim ($M = 36.89$, $SD = 6.26$). At the 4-month assessment, women in the program group who experienced moderate levels of sexual victimization over the 2-month interim reported higher levels of self-efficacy ($M = 41.13$, $SD = 4.84$) compared to women in the placebo-control group who experienced moderate levels of sexual victimization over the 2-month interim ($M = 32.60$, $SD = 6.31$).

Pairwise comparisons next examined how, among women in each group, levels of self-efficacy varied at each assessment between women who experienced none,

moderate, or severe sexual victimization over the 2-month follow-up. At the 2-month follow-up, women in the placebo-control group moderately assaulted over the 2-month interim reported lower levels of self-efficacy ($M = 33.50$, $SD = 5.89$) than women in the placebo-control group who experienced severe sexual victimization ($M = 38.92$, $SD = 4.36$). At the 4-month follow-up, women in the placebo-control group who experienced no sexual victimization over the 2-month follow-up ($M = 38.13$, $SD = 5.78$) reported higher levels of self-efficacy than women in the placebo-control group who experienced moderate sexual victimization over the 2-month follow-up ($M = 32.60$, $SD = 6.31$). Analyses revealed no other significant differences in measures of self-efficacy.

Knowledge of sexual assault. Analyses revealed no significant differences on measures of knowledge of sexual assault over the 4-month follow-up.

The Impact of the Sexual Assault Risk Reduction Program on Sexual Victimization and Revictimization

A backward elimination log-linear analysis examined the interactions between program participation, history of adolescent sexual victimization, experiences of sexual victimization over the 2-month follow-up period, and sexual victimization over the 4-month follow-up period. The backward hierarchical log-linear procedure makes no distinction between independent variables and dependent variables and begins by placing all variables in the model (Tabachnick & Fidell, 2001). The associations that do not significantly degrade the model when removed are then deleted from the model, with the final model resulting in all significant associations between variables. Such an analysis strategy is ideal for exploring all possible associations between the impact of program participation, history of adolescent sexual victimization, and sexual victimization over the follow-up periods. Significant interactions between variables are explored through chi-square analyses.

The best fitting model included three two-way interactions, which included history of adolescent sexual victimization and sexual victimization over the 2-month follow-up period, $G^2(4, N = 125) = 63.30$, $p < .001$, sexual victimization over the 2-month follow-up period and sexual victimization during the 4-month follow up period, $G^2(4, N = 125) = 25.46$, $p < .001$, and program participation and sexual victimization over the 2-month follow-up period, $G^2(2, N = 125) = 6.40$, $p < .05$.

Chi-square analyses explored the significant relationship between history of adolescent sexual victimization and sexual victimization over the 2-month follow-up, $\chi^2(4, N = 125) = 72.88$, $p < .001$. Of the women with a history of adolescent sexual victimization ($n = 48$), 39.6% ($n = 19$) experienced moderate sexual victimization and 29.2% ($n = 14$) experienced severe sexual victimization over the 2-month follow-up period. Of those women without a his-

tory of adolescent sexual victimization ($n = 77$), 7.8% ($n = 6$) experienced moderate sexual victimization and 1.3% ($n = 1$) experienced severe sexual victimization over the 2-month follow-up period.

Chi-square analyses explored the significant relationship between sexual victimization over the 2-month follow-up period and sexual victimization over the 4-month follow-up period, $\chi^2(4, N = 125) = 36.57$, $p < .001$. Of the women who experienced some form of sexual victimization over the 2-month follow-up period ($n = 40$), 25% ($n = 10$) experienced moderate sexual victimization and 15% ($n = 6$) experienced severe sexual victimization over the 4-month follow-up period. Of those women who did not experience sexual victimization over the 2-month follow-up period ($n = 85$), 7.1% ($n = 6$) experienced moderate sexual victimization and 1.1% ($n = 1$) experienced severe sexual victimization over the 4-month follow-up period.

Chi-square analyses examined the significant relationship between program participation and sexual victimization over the 2-month follow-up period, $\chi^2(2, N = 125) = 6.06$, $p < .05$. Of the 68 women in the placebo-control group who attended the 4-month follow-up, 14.7% ($n = 10$) reported moderate sexual victimization and 17.6% ($n = 12$) reported severe sexual victimization at the time of the 2-month follow-up. Of the 57 women in the program group who attended the 4-month follow-up, 26.3% ($n = 15$) reported moderate sexual victimization and 5.3% ($n = 3$) reported severe sexual victimization over the 2-month follow-up (see Table 3).

Because a significant two-way interaction was not evidenced between program participation and sexual victimization over the 4-month interim, results suggested that the program was ineffective in reducing incidence of sexual victimization among program participants over the 4-month follow-up period. Further, because no significant three-way interaction was evidenced between history of adolescent sexual victimization, program participation, and victimization over the 4-month interim, and no significant three-way interaction was evidenced between victimization over the 2-month follow-up, group membership, and victimization

Table 3

Sexual Victimization Experiences Over the 2-Month Follow-Up Among Participants Completing the 4-Month Follow-Up

	<i>Experimental</i> ($N = 57$)		<i>Control</i> ($N = 68$)	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
2-Month Victimization Status				
None	39	64.9%	40	67.7%
Moderate	15	26.3%	10	14.7%
Severe	3	5.3%	12	17.6%

Note. $\chi^2(2, N = 125) = 6.06$, $p < .05$.

Table 4

An Analysis of Participants' Use of Self-Defense Tactics Over the 4-Month Follow-Up as a Function of Program Participation

<i>Tactics</i>	<i>Experimental</i>		<i>Control</i>		χ^2	<i>p</i>
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>		
<u>Use of Assertive Body Language</u>					7.35	<i>p</i> < .01
No	17	26.6	35	49.3		
Yes	47	73.4	36	50.7		
<u>Use of Assertive Verbal Response</u>					2.93	<i>p</i> = .08
No	18	28.1	30	42.3		
Yes	46	71.9	41	57.7		
<u>Avoiding "Telegraphing" Emotions</u>					25.53	<i>p</i> < .001
No	20	31.3	53	74.6		
Yes	40	68.8	18	25.4		
<u>Increased Attention to your Intuition</u>					5.73	<i>p</i> < .05
No	17	26.6	38	46.5		
Yes	47	73.4	33	53.5		
<u>Yelling and Running</u>					0.37	<i>n.s.</i>
No	58	90.6	62	87.3		
Yes	6	9.4	9	12.7		
<u>Physical Self-Defense</u>					1.34	<i>n.s.</i>
No	59	92.2	61	85.9		
Yes	5	7.8	10	14.1		

over the 4-month follow-up, results further indicate that the program was not differentially effective over the course of the 4-month follow-up for women as a function of sexual victimization history.

Impact of the Sexual Assault Risk Reduction Program on Attributions of Blame

A series of analyses of variance were conducted to explore differences in levels of attributions of blame among women who experienced sexual victimization over the 2-month and 4-month follow-up periods in the program and placebo-control groups. Results suggested that levels of blame (i.e., behavioral self-blame, characterological self-blame, rapist blame, chance blame, and societal blame) did not differ as a function of program participation among women who were victimized over the 2-month or 4-month follow-up periods.

Use of the Self-Defense Strategies as a Function of Program Participation

Results suggested that at the 4-month follow-up, compared to control group women, program participants reported more frequent use of assertive body language, $\chi^2(1, N = 135) = 7.35, p < .01$; avoidance of telegraphing emotions, $\chi^2(1, N = 131) = 23.53, p < .001$; and attention to their intuition, $\chi^2(1, N = 135) = 5.73, p < .05$ (see Table 4).

DISCUSSION

The current study examined the efficacy of a revised version of a previously evaluated sexual assault risk reduction and self-defense program for college women. The study represents only the second controlled outcome study of a sexual assault risk reduction program with a self-defense component that utilized random assignment. The present evaluation improved the existing research methodology by utilizing an alternative health intervention among control group participants (i.e., placebo-control group) rather than a wait-list control group. Notably, whereas the use of placebo-control groups is a common element in research examining the efficacy of various therapies and interventions (Ogles et al., 2002), these groups are seldom included in studies that evaluate sexual assault risk reduction and prevention programming.

Consistent with the socio-ecological model and the theory of planned behavior, the current study revised the program protocol to present risk reduction strategies as a lifestyle that might require some women to change how they currently perceive dating situations, plan how they will respond to risky dating situations, and prioritize their personal safety over social pressures. Although the current study did not directly compare the revised program to the previous program protocol (see Gidycz et al., 2006), results suggested that the program protocol was effective in accomplishing several of its goals.

Findings indicated that the revised protocol was effective in increasing women's use of self-protective behaviors,

assertive sexual communication, and self-efficacy in resisting against potentially threatening dating situations over the 4-month follow-up period. After participating in the risk reduction program, women were more likely to talk to their partner about their sexual likes and dislikes, monitor their partner's alcohol intake while in dating situations, and feel more confident guarding against potential attackers. Such data indicate that participation in the program may have aided women in surmounting the psychological barriers that make it difficult for women to recognize that a dating situation is risky, assess the level of risk involved, develop a plan for how to effectively respond, and respond assertively (Norris et al., 1996; Norris et al., 1999; Nurius, 2000; Rozee & Koss, 2001). Results also suggested that, compared to control group women, program participants were more likely to utilize assertive body language, pay attention to their intuition, and avoid telegraphing their emotions. Self-protective strategies such as these, which were modeled for women during the self-defense component of the program, may help women to recognize and respond assertively to potential attackers.

Although it is unclear why program participants evidenced higher baseline scores of self-protective behaviors compared to the placebo-control group, it is notable that self-protective behaviors reported by the placebo-control group continued to decline over time, whereas self-protective behaviors reported by the program group increased and were maintained over time. Given that the majority of women in the current study were in their first year of college, it is likely that the use of protective behaviors may generally decline as women acclimate to college and feel safer in their surroundings. Risk reduction programs may be useful in ensuring that women maintain a vigilant stance throughout their college years.

It was surprising that, compared to women in the placebo-control group, program participants evidenced higher levels of assertive sexual communication only at the 4-month follow-up. Although speculative, it is possible that developing assertive sexual communication skills was an ongoing process for program participants, especially for women who had further opportunities to discuss and to think about program material over time. It is also possible that, over the course of the short-term follow-up, the opportunity did not present itself for women to utilize assertive sexual communication skills. Research examining women's hesitations to engage in self-protective behaviors is needed to better understand the processes by which women develop and maintain assertive communication skills.

A three-way interaction between sexual victimization over the 2-month interim, program participation, and levels of self-efficacy was also evidenced. Women moderately victimized over the 2-month follow-up period in the treatment group evidenced increases in self-efficacy over time, whereas women moderately victimized over the 2-month follow-up in the control group evidenced decreases in self-efficacy over time. One explanation for higher levels of

self-efficacy among women who experienced moderate sexual victimization in the program group may be that these women successfully used resistance strategies to prevent the escalation of violence during a risky dating situation. Indeed, women who participated in the self-defense program reported more frequent use of self-defense strategies at the 4-month follow-up compared to women in the placebo-control group.

Findings also revealed that women in the placebo-control group moderately assaulted over the 2-month interim reported lower levels of self-efficacy compared to those who experienced severe sexual victimization over the 2-month follow-up. Although speculative, it is possible that women moderately victimized, in hindsight, may feel that there was more they could have done to get out of the situation. Such interpretations of their assault may negatively influence their ratings of self-efficacy in resisting against a future attacker. It is important to note, however, that the level of self-efficacy among women victimized in the placebo-control group was still lower than the level of self-efficacy among women victimized in the program group. After participating in the risk reduction program, women may be more aware of ways to respond to risky dating situations and, as a result, feel more confident in their ability to resist against a potential attacker.

Differences in the frequency of sexual victimization over the 2-month follow-up between program and control group participants provide further support for the notion that acts of violence were less likely to escalate among program group participants. Specifically, when data from the 4-month follow-up period were examined, results suggested that program participation was significantly associated with differences in frequencies of sexual victimization over the 2-month follow-up. Importantly, whereas rates of sexual victimization in the program and control group were similar, three times as many rapes were reported among control group women compared to women who participated in the risk reduction program. Future research should include a more comprehensive measure that assesses the specific use of risk reduction strategies taught in the context of self-defense programming. The use of such a measure will allow researchers to obtain important contextual information about strategies that lead to rape avoidance.

Although the program did not lead to reductions in self-blame for participants, it is important to note that there were no increases in self-blame for the program women. This finding addresses the concern about possible deleterious effects for women participating in programming that addresses their behaviors. Although it is positive that program participants who experienced sexual victimization over the follow-up did not report increased levels of self-blame, this finding is inconsistent with prior evaluation of the Ohio University Sexual Assault Risk Reduction Program. Specifically, prior program evaluation documented increased perpetrator blame and decreased self-blame among program participants who experienced sexual victimization over the

follow-up (i.e., Gidycz et al., 2006). One possible explanation for this finding is that the current study utilized the Rape Attribution Scale to assess attributions of blame, whereas prior programs have been evaluated with single-item rating scales. Because sexual victimization is at times unavoidable, an important component of risk reduction programming is communicating to women that they are never to blame for experiences of sexual victimization. It is also important to screen for potential deleterious effects of program participation and to provide women with strategies to further their recovery should they experience an assault.

Differential dropout rates over the 2-month follow-up as a function of baseline levels of assertive sexual communication and differential dropout rates over the 4-month follow-up as a function of levels of self-efficacy and self-protective behaviors were also evidenced. However, it is significant that dropout rates between program and control groups did not differ as a function of history of victimization status because prior experience of sexual victimization has been consistently found to be the strongest predictor of subsequent victimization. Further, even when losing women in the program group who scored high on measures of self-protective behaviors and self-efficacy—which would make it more difficult to potentially find significant differences between groups—analyses suggested that program participants reported significantly higher scores on these outcome measures at the 4-month follow-up.

Whereas data indicated that the revised program protocol was successful in accomplishing its goal of increasing participants' active use of risk reduction strategies against sexual assault, it was surprising that program participants did not evidence increases in knowledge of sexual assault in comparison to women in the placebo-control group. This result is especially surprising given results of Anderson and Whiston's (2005) recent meta-analysis that documented that knowledge of sexual assault is often the most significant effect of sexual assault programming. Given that both program and placebo-control group participants reported high scores on the knowledge outcome measure at the baseline assessment, it is possible that the lack of significant differences in knowledge of sexual assault between groups is due to a ceiling effect. Revising the knowledge measure to be more sensitive to detecting differences in women's knowledge of risk reduction strategies should be considered in future program evaluations. Additionally, whereas assessment of women's factual knowledge of risk factors for sexual assault is certainly useful, we believe that a more critical component to program evaluation is assessing how women utilize their knowledge of risk factors for sexual assault to recognize risky dating situations and respond assertively once threat is detected.

Limitations

Researchers face a number of challenges when demonstrating that a program is effective in reducing the incidence of

sexual victimization. The prospective nature of the current evaluation is limited by low return rates for the 4-month follow-up. Not only did the short-term nature of follow-up periods prevent a more comprehensive analysis of how the program may have influenced women's behaviors over time, the voluntary nature of the follow-up sessions precluded garnering a high follow-up rate for the 4-month follow-up session. In a previous evaluation of the current risk reduction program, 70% of participants returned to participate in the 6-month follow-up session when provided with financial compensation for completing questionnaires (Gidycz et al., 2006). Such a result underscores the difficulty of conducting longitudinal research of sexual assault programming without funding to pay participants to return for follow-up assessments or without institutional mandates to attend. However, despite the small follow-up sample and attrition of program group women who reported high scores on program outcome measures, results suggested significant differences between program and control groups on all but one outcome measure (i.e., knowledge measure). Future research must examine the long-term effectiveness of sexual assault programming, applying follow-up procedures that track women across the course of an academic year or follow women from entrance to college to graduation. Additionally, the sample of college women garnered for the current evaluation, although consistent with the demographics of the university, was limited in ethnic diversity. Reliance on self-report measures further limits the current results, given the potential biases inherent to self-report measures of attitudes and behaviors.

Implications for Research and Risk Reduction Programming

Future evaluations of sexual assault risk reduction programming can also benefit by broadening the format in which programming is delivered. For example, a number of researchers of sexual assault prevention programming for men have noted the usefulness of providing programming efforts to intact groups of men who share similar social norms (Berkowitz, 2002). It follows that it may also be helpful for women to participate in programming efforts with women from their social communities to encourage women to engage in a more fluid discussion of the potential barriers to and benefits of engaging in strategies to reduce their risk of sexual victimization.

Whereas the current study addresses the lack of empirically driven and systematically developed sexual assault risk reduction and self-defense programming for college women, there is also a shortage of research and development of sexual assault risk reduction programming for non-college women. An important area for future research is examining how existing risk reduction programs for college women may be modified and adapted for use in military and community populations. In addition, additive and dismantling methodologies may be utilized in program evaluations

to determine the effective components of risk reduction programs. To develop effective sexual assault prevention efforts, it is vital that the developers of all types of sexual assault prevention efforts continue to systematically revise programming according to theoretical developments and results of empirical evaluation.

An updated array of program outcome measures, including specific measures of women's psychological barriers to resistance, may also enhance future program evaluation. Measures of psychological functioning may be included to examine how program participation is related to the psychological and health outcomes of women who experience sexual victimization following participation in the program. Future studies may also examine more closely how women successfully navigate to resist against potential attackers. It is likely that women successfully defend against an array of risky dating situations, and these situations are not recorded on current instruments that assess the frequency of sexual victimization (see Livingston, Buddie, Testa, & VanZile-Tamsen, 2004).

Conclusion

Ultimately, it is the responsibility of perpetrators to end sexual violence against women. In the meantime, however, research suggests that resistance strategies do not increase women's likelihood of personal injury and in many cases resistance tactics can be useful in preventing sexual assault (Brecklin & Ullman, 2004; Ullman, 1998; Ullman & Knight, 1992). Given that rates of sexual victimization have yet to decline, it is essential that psychologists and health officials continue to systematically develop and evaluate sexual assault risk reduction programs to provide women with strategies to reduce their risk and defend against potential attackers.

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