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Running Head: EATING DISORDER PREVENTION IN SORORITIES

Reducing eating disorder risk factors in sorority members:

A randomized trial

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### Abstract

Although sororities are often perceived as contributing to eating disordered behavior, limited research has investigated eating disorders in sorority members. The purpose of this study was to investigate the utility of a highly interactive cognitive dissonance prevention program in reducing empirically supported risk factors in sorority members. Members ( $n=149$ ) were randomized to the highly interactive intervention, a more passive intervention, or waitlist. Results indicated that both interventions reduced dietary restraint, body dissatisfaction, and eating disorder pathology. Only the highly interactive group reduced thin-ideal internalization as compared to waitlist. Exploratory analyses also indicated that interventions were beneficial to both lower- and higher-risk members. Taken together, results suggest that sororities are a viable population to target in the prevention of eating disorders.

Eating disorders are associated with significant medical complications, comorbid psychopathology, and a variable course even with treatment (Wilson, Becker, & Heffernan, 2002). Although full syndrome anorexia nervosa and bulimia nervosa occur in a minority of college women, research indicates that sub-threshold eating pathology is relatively common (Mintz & Betz, 1988), suggesting that prevention of eating disordered behaviors is an important goal among college women. Significant effort has been devoted to preventing eating disorders at a variety of age levels. Until recently, however, many programs yielded few positive results, particularly with respect to behavior change (Pearson, Goldklang, & Striegel-Moore, 2002).

As noted by Stice, Trost, and Chase (2002), several features of early programs may account for initial findings. Early programs often utilized universal psychoeducation, providing didactic information about eating disorders to both low- and high-risk individuals. This type of program may not be optimal in that didactic education alone, particularly when delivered with a universal focus, may not persuade individuals to change behavior. Results from other areas of psychopathology suggest that information alone typically is insufficient to change behavior (Larimer & Crouse, 2002). Moreover, as suggested by Mann et al. (1997), such programs may be problematic because they educate participants about eating disorder behaviors and/or normalize such behaviors. Finally, results from a recent meta-analysis (Stice & Shaw, 2004) indicate that programs that omit eating disorder psychoeducation may produce larger effects than those that include it and suggest that interactive programs may be superior to didactic programs.

Researchers also have noted that the needs of individuals who have few risk factors may differ from those who are at increased risk (e.g., Abascal, Brown, Winzelberg, Dev, & Taylor, 2004; Mann et al., 1997; Stice & Shaw, 2004). For instance, Mann et al. (1997) suggested that universal psychoeducation programs may harm low-risk individuals under certain circumstances,

and Stice and Shaw (2004) found that universal programs produced smaller effects compared to selective programs. In contrast, however, a recent study investigating the efficacy of a cognitive-behavioral internet program produced differing results. Although motivated high-risk participants produced more positive and fewer negative remarks when grouped with similar participants versus being grouped with lower-risk or less motivated peers, there were no differences in outcome based on risk status (Abascal et al. 2004). Thus, it remains unclear whether or not high- and low-risk individuals can and/or should be combined in programs that are not primarily educational.

Recent research often has replaced universal psychoeducation programs with selective interactive programs targeting risk factors (Stice & Shaw, 2004). One promising approach appears to be the use of cognitive dissonance (CD) to reduce internalization of the thin-ideal in high-risk females. In a series of studies (Stice, Chase, Stormer, & Appel, 2001; Stice, Mazotti, Weibel, & Agras, 2000; Stice, et al., 2002), Stice and colleagues found that CD appears to reduce several empirically supported eating disorder risk-factors. For instance, Stice et al. (2000) found that a three-session CD group produced improvement in thin-ideal internalization, dietary restraint, eating pathology, body dissatisfaction, and negative affect. Stice et al. (2002) compared CD to a healthy weight management group and a waitlist control group (WL). Although six-month follow-up revealed that effects were somewhat reduced, both interventions produced changes in internalization, eating pathology, and negative affect as compared to WL.

In an attempt to replicate these findings, Becker, Jilka, and Polvere (2002) conducted a randomized pilot study with 24 high-risk sorority members. They compared a two-session CD group, developed from the published description of the three-session group tested by Stice et al. (2000), to a more passive intervention. This group contained much of the same content as CD,

but replaced structured dissonance exercises (e.g., writing and role playing) with videotapes. We developed the more passive group in an attempt to tease apart the content of CD (i.e., education about the thin-ideal) from the interactive (i.e., supposedly dissonance producing) nature of CD. Results indicated that both interventions reduced dietary restraint, eating pathology, and body dissatisfaction. CD also decreased thin-ideal internalization and produced greater reductions in dissatisfaction as compared to the more passive intervention.

Surprisingly little research has been conducted with sororities given the perception that sorority women are at increased risk for eating pathology (Alexander, 1998). Despite the lack of research, however, sorority members represent an important population to target because limited data suggest that members may be at increased risk for eating disorders. For example, Crandall (1988) found that sorority members were more likely to binge eat compared to non-sorority women, and Cashel, Cunningham, Landeros, Cokley, and Muhammad (2003) found that Caucasian sorority members reported greater internalization of sociocultural attractiveness standards compared to non-sorority Caucasian students. Sorority members, however, did not score higher on 10 out of 11 Eating Disorder Inventory subscales. Thus, although insufficient research has been conducted to draw definite conclusions regarding role of sororities in elevating eating disorder risk status, preliminary research supports further investigation.

The primary purpose of this study was to replicate our earlier study (Becker et al., 2002) with a larger sample and the addition of a randomized WL group. Based on our pilot study, we hypothesized that the CD would be superior to our second intervention, media psychoeducation (MP). Although the mechanism of action in CD is currently unclear, we hypothesized that the more interactive intervention (i.e., CD) would produce superior results. We also hypothesized that both interventions would be superior to WL.

In addition to our main goal, we sought to explore the issue of combining low- and high-risk individuals. After the pilot study, we contacted past participants, who encouraged us to recruit all sorority members, not just those deemed at risk. Based on the pilot study's screening, in which over 50% of sorority members did not meet our high-risk criteria, we realized that many members might be classified as low-, or lower-, risk individuals<sup>1</sup> and that the current study likely would mix lower- (LR) and higher-risk (HR) women. Given Mann et al.'s (1997) concerns, we decided to investigate whether LR and HR participants responded differently. Because CD and MP do not include information that might normalize eating disorder behavior, we hypothesized that both HR and LR individuals would benefit from the both interventions.

## Method

### *Participants*

We recruited 161 sorority members from the six university sororities<sup>2</sup>, which are all local (i.e., not affiliated with national sororities) and non-residential.<sup>3</sup> Participants ranged in age from 18 to 22 ( $M=19.95$ ,  $SD=.90$ ). Mean body mass index (BMI), which was based on self-report height and weight, was 22.01 ( $SD=2.65$ ), and 89% of participants self-identified their ethnicity as Caucasian. The remainder endorsed Hispanic (5%), Asian (4%), and "other" (1%).

### *Procedure*

Prior to beginning, we received approval from the university Institutional Review Board, Greek Council, and Student Affairs. Student researchers recruited participants at weekly sorority meetings, and 245 members completed randomization consent forms. The primary reasons for failure to randomize were scheduling conflicts or the member graduated prior to randomization.

During the first year of the study, sororities offered service credit for participation. By year two, sorority leaders reported that the credit incentive no longer appeared necessary.

Leaders agreed to give credit, however, if members requested credit. Although exact numbers are unavailable, we understand that such requests were infrequent. Members throughout the study reported participating for the following reasons: a) sorority loyalty, b) wanting to help out sorority members involved in running the study, and c) hearing that it was a positive experience. Sorority members almost never mentioned service credit as their primary reason for attending.

Participants were randomized into CD, MP, or WL. During year two, sorority leaders requested that members who had completed consent forms the previous year only be randomized CD or MP so as not to frustrate those members. To maintain our relationship with the sororities, we agreed. This resulted, however, in fewer participants being randomized to WL.

Both CD and MP consisted of two 2-hour sessions scheduled one week apart. Groups ranged in size from six to sixteen participants and were led by a licensed clinical psychologist (CB) and two undergraduate student co-leaders. Participants completed a consent form and a baseline questionnaire packet at the start of all conditions. Because some questionnaires assessed a longer period of time than one week, we instructed participants to respond based on the past week during the post-intervention assessment, which was completed at the end of session two. The one-month follow-up assessment was identical to the baseline assessment.

*Intervention: Cognitive Dissonance Group<sup>4</sup>*

*Session 1.* After presenting participants with an overview of the study, we stated that sororities were targeted not because we believed they contributed to eating disorders, but rather because their organizational structure gave them power to create change. Members then described the thin-ideal, discussed how it is maintained, and identified who benefits from its existence. Next they completed an individual writing exercise which entailed listing the costs of pursuing the thin-ideal. Each member shared her costs with the group, which then collectively



discussed the degree to which the thin-ideal is attainable, taking costs into account. The session ended with a homework counter-attitudinal exercise. We instructed members to stand in front of a mirror wearing as little clothing as was comfortable. While doing so, members noted only positive attributes including physical, emotional, and mental qualities. We informed participants that they would be sharing their experience with this exercise during the next session.

*Session 2.* Members began by sharing positive attributes they had noticed in the mirror exercise. Next, they discussed pressures placed on first-year college women to pursue the thin-ideal and developed strategies to improve the body image of sorority members. We then discussed the time and effort needed to make celebrities appear ideal. Participants reflected on the information, adding to it based on their knowledge of celebrity culture, and were then separated into subgroups for a role-play exercise. In the role-play, members' goal was to convincing each of the group leaders to give up pursuit of the thin-ideal. One leader role played a student with anorexia nervosa, one a compulsive exerciser, and one an excessive and unhealthy dieter. Subgroups brainstormed reasons why each leader should stop pursuing the thin-ideal and then rotated to each leader. Members then discussed the role-play and made final remarks.

*Intervention: Media Psychoeducation Group*

*Session 1.* As in CD, we provided an overview, reassured sorority members regarding the rationale for targeting sororities, and began with a collectively generated description of the thin-ideal. The group then discussed the media's influence on the thin-ideal, with a focus on advertising. Participants discussed ways in which advertisements perpetuate the thin-ideal. Following this, participants watched a 35-minute video aimed at the influence of advertising on body image and the perpetuation of the thin-ideal. Participants shared their reactions to the video and brainstormed strategies to counteract media pressures to pursue the thin-ideal.

*Session 2.* We began by discussing the attainability of the thin-ideal and expanding discussion from advertising to all forms of media. Participants discussed the difference between media figures and themselves, whether or not achieving the thin-ideal is realistic, and costs associated with the pursuit of the thin-ideal. We then held the same discussion as in CD about celebrities. Next, participants watched a 20-minute edited version of a video on eating disorders. The video contained stories from individuals who had recovered from an eating disorder and examples of women who ceased pursuit of the thin-ideal. The video also provided information about the long-term effects of eating disorders. The movie was edited to remove all details about the specific behaviors associated with eating disorders in order to minimize the likelihood of normalizing specific behaviors. The group discussed the video and made final comments.

### *Measures*

Our dependent measures included the Eating Attitudes Test-26 (EAT-26: Garner, Olmsted, Bohr, & Garfinkel, 1982), the Eating Disorder Examination Questionnaire (EDE-Q: Fairburn & Beglin, 1994), the Dutch Restrained Eating Scale (DRES: van Strien, Frijters, van Staveren, Defares, & Deurenberg, 1986), the Body Shape Questionnaire (BSQ: Cooper, Taylor, Cooper, & Fairburn, 1987), the Sociocultural Attitudes Towards Appearance Scale-3 (SATAQ-3: Thompson, van den Berg, Roehrig, Guarda, & Heinberg, 2004), and the Ideal-Body Stereotype Scale-Revised (IBSS-R: Stice, Ziemba, Margolis, & Flick, 1996). The EAT-26, which assesses attitudes and behaviors associated with eating, is a commonly used, validated questionnaire (Garner, 1995). The EDE-Q, which assesses eating attitudes and behaviors over a 28-day period, consists of four subscales: restraint, weight concern, eating concern, and shape concern. The subscales have acceptable internal consistency and two week test-retest reliability, with Chronbach alphas and Pearson coefficients for all scales consistently exceeding 0.80 (Luce

& Crowther, 1999). The DRES assesses dietary restraint. Research supports its internal consistency ( $\alpha = .95$ ) and predictive validity (Stice & Agras, 1998; van Strien et al., 1986). The BSQ assesses body dissatisfaction. Cooper et al. (1987) found that BSQ scores differed for eating disorder patients compared to non-patients, and also correlated with EAT scores, providing some support for concurrent validity. The SATAQ-3 consists of statements regarding media and thinness. Participants rate their agreement with the statements. Media influences include internalization, pressures, and importance. Thompson et al., (2004) found that eating disturbed individuals scored significantly higher on internalization compared to controls. The IBSS-R presents statements regarding the thin-ideal standard of female beauty. Participants rate the degree to which they agree with statements. The IBSS-R has good internal consistency ( $\alpha = .89$ ) (Stice & Agras, 1998) and acceptable test-retest reliability ( $r = .63$ ) (Stice, 2001).

### *Constructs*

Because we were limited to self-report and because different measures may assess different aspects of constructs, we decided to use multiple measures for the main constructs of interest in order to improve measurement reliability (Kazdin, 2003). These constructs included restraint, thin-ideal internalization, body dissatisfaction, and overall eating disorder pathology.

Restraint indicates the degree to which participants limit food intake. We generated a restraint score by averaging the raw EDE-Q restraint scale and DRES. This scale evidenced good internal consistency ( $\alpha = .91$ ). Body dissatisfaction indicates the degree of body shape and weight dissatisfaction. We generated a body dissatisfaction score by averaging mean BSQ scores and EDE-Q weight and shape concern subscales. As with restraint, scales were not standardized prior to averaging. Analyses indicated the composite scale was internally consistent ( $\alpha = .97$ ). Thin-ideal internalization refers to the degree to which participants endorse the thin-ideal as the

female standard of attractiveness. We averaged the two SATAQ-3 internalization raw scores with the IBSS-R to create a composite score. This scale was somewhat less consistent than the other scales ( $\alpha = .66$ ). To provide a composite measure of eating disorder pathology, we averaged the mean raw EAT-26 and EDE-Q total score. This construct evidenced good internal consistency ( $\alpha = .90$ ) and indicates the degree of eating disordered behaviors and attitudes.

### Results

Because this study investigated prevention, versus treatment, we identified participants who appeared to meet criteria for a current eating disorder based EDE-Q responses. Members who reported past eating disorders were not excluded. Although the EDE-Q primarily is used to assess eating disorder pathology, it has been used to generate probable eating disorder case status based on the 28-day assessment period (e.g., Black & Wilson, 1996; Hulley & Hill, 2001). We determined case status by examining responses to diagnostic questions that correspond to DSM-IV (American Psychiatric Association, 1994) criteria (for additional detail see Becker, DeViva, & Zayfert, 2004). Twelve women met criteria for a probable eating disorder. These women were not evenly distributed across conditions; six were randomized to CD and three each to MP and WL. Although this difference was not statistically significant, we excluded these women from the analyses<sup>5</sup>, leaving 149 participants comprising the final sample.

One-way analysis of variance (ANOVA) indicated that the three groups did not differ in terms of age or BMI. Although CD scored higher at baseline than MP or WL on the dependent constructs, one-way ANOVAs yielded no significant baseline differences in the four constructs. Despite the lack of significance, we conducted repeated measures ANOVAs to control for baseline differences in an attempt to limit the possibility that differences accounted for intervention effects. Although the groups also did not differ in terms of the percentage of

individuals who dropped out during the active phase of the study (CD = 12%; MP = 14%; WL = 11%), we conducted intent-to-treat analyses by carrying forward last scores.

In order to examine whether HR and LR groups responded differentially, we conducted a median-split using baseline BSQ ( $Mdn = 84$ ). We chose the BSQ because body dissatisfaction is considered to be a key risk factor for the development of eating disorders (Stice, 2001) and because the BSQ has been used in other prevention studies to identify HR participants (e.g., Zabinski et al., 2001). Seventy-six participants with scores of 84 or higher on the BSQ were coded as HR and 73 with scores below 84 were coded as LR. HR participants' BSQ scores ( $M = 113.21$ ,  $SD = 24.31$ ) were approximately one half of a standard deviation below the norms reported by Rosen, Jones, Ramirez, and Waxman (1996) for body image therapy patients, and BSQ scores for the LR group ( $M = 64.67$ ,  $SD = 10.45$ ) were approximately one full standard deviation below the norms reported for non-clinical university student sample. HR and LR differed significantly on BSQ scores,  $t(147) = 15.72$ ,  $p = .0001$  and EDE-Q scores (LR  $M = .98$ ,  $SD = .52$ ; HR  $M = 2.61$ ,  $SD = .87$ ),  $t(147) = 13.76$ ,  $p = .0001$ . The mean EDE-Q total score for HR was within one standard deviation of the eating disorder case means reported by Mond, Hay, Rodgers, Owen, and Beumont (2004), and the mean score for LR was below the non-case mean.

Table 1 shows the means for each of the four constructs by group and assessment period, and includes both intent-to-treat and completer Cohen's  $d$  for each group from baseline to follow-up. To determine whether or not there was a difference between the groups over time on the four constructs, we conducted four repeated measures ANOVAs. Risk status was included in order to investigate the role of risk status. Thus, we conducted four  $2 \times 3 \times 3$  (risk status x group x time) repeated measure ANOVAs. We report eta-squared values for effect sizes. Post-hoc  $2 \times 3$  (group x time) repeated measure ANOVAs were used to tested specific hypotheses.

The repeated measures ANOVA for restraint yielded a significant time effect,  $F(1, 142) = 20.10, p = .0001, \eta^2 = .11$ , risk status effect,  $F(1, 142) = 81.05, p = .0001, \eta^2 = .36$ , and a group by time interaction,  $F(2, 142) = 5.50, p = .005, \eta^2 = .06$ . There was no effect for group,  $F(2, 142) = .38, p = .68, \eta^2 = .00$ , no group by risk status interaction,  $F(2, 142) = .17, p = .91, \eta^2 = .00$ , no time by risk status interaction,  $F(1, 142) = 1.07, p = .30, \eta^2 = .01$ , and no group by time by risk status interaction,  $F(2, 142) = 2.10, p = .13, \eta^2 = .02$ . These results indicate that although there was a significant difference between the LR and HR participants, this difference did not moderate intervention effects. To investigate the group by time interaction, we conducted a post-hoc repeated measures ANOVA comparing CD and MP. Contrary to our hypothesis that CD would be superior to MP, we found no difference between the CD and MP (Table 1). Two additional repeated measures ANOVAs comparing CD and MP to WL indicated that both groups significantly differed compared to WL, supporting our hypothesis.

For internalization, we found an effect for time,  $F(1, 137) = 20.68, p = .0001, \eta^2 = .13$ , and risk status,  $F(1, 137) = 52.26, p = .0001, \eta^2 = .28$ . There was no group effect,  $F(2, 137) = .71, p = .50, \eta^2 = .01$ , no group by time interaction,  $F(2, 137) = 1.9, p = .15, \eta^2 = .02$ , no group by risk status interaction,  $F(2, 137) = 1.65, p = .20, \eta^2 = .02$ , no time by risk status interaction,  $F(1, 137) = .04, p = .84, \eta^2 = .00$ , and no group by time by risk status interaction,  $F(2, 137) = 1.04, p = .355, \eta^2 = .01$ . Results suggest that all groups decreased internalization over time and that, as with restraint, risk status did not influence intervention effects. Despite our failure to find the expected group by time interaction, we conducted exploratory post-hoc ANOVAs comparing CD and MP to each other and to WL to test our main hypotheses. We found no differences between CD and MP, and only CD showed a significantly greater effect than WL (Table 1).

Thus, although both interventions reduced internalization, only CD did so to a degree that was significantly different as compared to WL.

For eating disorder pathology, we found a time effect,  $F(1, 142) = 23.25, p = .0001, \eta^2 = .12$ , a risk status effect,  $F(1, 142) = 131.45, p = .0001, \eta^2 = .48$ , and a time by group interaction,  $F(2, 142) = 9.32, p = .0001, \eta^2 = .10$ . There was no group effect,  $F(2, 142) = .71, p = .49, \eta^2 = .01$ , no group by risk status interaction,  $F(2, 142) = .41, p = .66, \eta^2 = .00$ , no time by risk status interaction,  $F(1, 142) = .07, p = .79, \eta^2 = .00$ , and no time by group by risk status interaction,  $F(2, 142) = 1.61, p = .32, \eta^2 = .01$ . Thus, results indicate that risk status did not moderate intervention effects. Post-hoc comparisons indicated that CD and MP did not differ from one another, and that each group differed significantly as compared to WL (Table 1).

For body dissatisfaction, we found a time effect,  $F(1, 142) = 35.48, p = .0001, \eta^2 = .18$ , a risk status effect,  $F(1, 142) = 163.53, p = .0001, \eta^2 = .53$ , and a group by time interaction,  $F(2, 142) = 7.27, p = .001, \eta^2 = .07$ . There was no group effect,  $F(2, 142) = 1.80, p = .17, \eta^2 = .01$ , no group by risk status interaction,  $F(2, 142) = .82, p = .442, \eta^2 = .01$ , no time by risk status interaction,  $F(1, 142) = 1.49, p = .224, \eta^2 = .01$ , and no group by time by risk status interaction,  $F(2, 142) = .46, p = .64, \eta^2 = .00$ . Post-hoc comparisons indicated that the two active groups did not differ from one another, and that each active group differed significantly as compared to WL.

## Discussion

Consistent with our hypotheses, results indicated that both CD and MP participants decreased restraint, eating disorder pathology, and body dissatisfaction as compared to WL. CD participants also reduced thin-ideal internalization compared to WL. Contrary to our hypothesis that CD would produce larger changes, we found no difference between CD and MP.

The lack of difference between CD and MP appears to run counter to the Stice and Shaw meta-analysis (2004), which found that interactive programs were more effective than didactic ones. Several factors may account for this. First, MP is not purely didactic. MP included active discussions and participants were encouraged to apply what they had learned to combat the thin-ideal within the sororities. Thus, whereas CD was highly interactive, MP might be viewed as somewhat interactive. Second, although we attempted to remove the most active, dissonance producing components of CD when designing MP, it is possible that simply discussing the costs of the thin-ideal and encouraging members to resist this ideal was sufficient to produce some dissonance. Thus, CD and MP may not be sufficiently different. Third, because groups mixed participants across sororities, it is possible that there were spillover effects. Although we cannot rule out this possibility, our impression from feedback sessions and subsequent studies is that participants had only a vague sense of the differences between CD and MP. Cross-talk between members seemed to focus on common content. Participants in CD seemed to be aware that “the other group” watched videos, but beyond that thought the groups were the same. Participants in MP also reported awareness that there was a non-video group, but had no sense of what had occurred in that group. Thus, although spillover may have occurred, we believe that the similarity in outcome likely was due to the similarity in content between the two groups.

The failure to find a difference between MP and WL on thin-ideal internalization is interesting, particularly given the finding that CD and MP were not significantly different. The lack of difference between MP and WL appears to be driven, in part, by a decrease in internalization in the WL group. Because this change did not occur in any of the other constructs we are inclined to interpret this as a random finding or measurement effect that may be specific to internalization. Stice et al. (2002) found a similar internalization change in their WL group



(one month follow-up  $d = .23$ ), which may support the measurement effect interpretation. Regardless of WL, however, MP appeared to produce smaller, though not significantly smaller, within condition internalization effect sizes compared to CD. This may suggest that MP is a slightly weaker version of CD and that this difference affects internalization to the greatest degree. Thus, whereas both groups produced similar changes on most dependent constructs, it may be that the active elements of CD are most useful in decreasing internalization. Results from our pilot study in HR sorority members (Becker et al., 2002), which showed a significant difference between CD and MP on internalization, provide some support for this interpretation.

Results support those reported by Stice and colleagues (Stice et al., 2000; Stice et al., 2001; Stice et al., 2002) and suggest that the basic elements of CD are efficacious in reducing eating disorder risk-factors. With the exception of restraint, within condition intent-to-treat effect sizes for our sample fell within the range of within condition effects sizes generated in the series of Stice et al. studies, which appear to have used completer analyses. Our success at replicating is promising given that we developed our own protocol. In addition, we obtained similar results using a two-session, albeit longer (i.e., four hour versus three hour), version.

The efficacy of MP in reducing body dissatisfaction, eating disorder pathology, and restraint raises some questions as to whether the primary mechanism of action in CD is, in fact, cognitive dissonance. Although, as noted above, it may be that discussing the thin-ideal and associated costs is sufficient to induce dissonance, MP excluded key exercises designed to induce participants into behaving contrary to the thin-ideal. In contrast, watching videos did not require participants to behave counter to the thin-ideal, and post-video discussion often did not induce participants into making counter thin-ideal statements. Thus, although Stice et al. (2000) designed CD to evoke dissonance, we suggest that it remains unclear whether dissonance is the

primary mechanism or whether another mechanism accounts for positive findings. For example, experimental demand may account for results. Most prevention programs, however, have not produced positive results, particularly on self-report measures of behavior change (Pearson et al., 2002). Thus, it is unclear why this study would produce demand or expectancy effects when other studies did not. An alternate explanation is that education about the origin of the thin-ideal and the costs of pursuing the thin-ideal encourages participants to decrease social comparison (Festinger, 1954), which Paxton et al. hypothesized may influence similarities between friends with regards to body image and eating behaviors (1999). Future research needs to investigate mechanisms of action so that critical components of successful interventions can be identified.

Mann et al. (1997) have raised concerns about mixing HR and LR individuals in eating disorder prevention programs. Results from this study a) indicate that risk status did not moderate intervention effects, b) do not support the concerns articulated by Mann et al., and c) suggest that LR and HR participants can be combined in some eating disorder prevention programs. Although we believe that Mann et al. raised an important concern regarding iatrogenic effects, it strikes us that the eating disorder prevention field may have become overly cautious with regards to combining LR and HR individuals. We hope that further research will explore the conditions under which LR and HR participants can and should be combined. Although selective programs may ultimately prove more efficacious for HR individuals (Stice & Shaw, 2004), under certain circumstances, it may not be pragmatic to target HR individuals separately. Thus, we need to determine whether both HR and LR individuals can benefit from newer programs. Also, as noted by Stice and Shaw, the distinction between universal and selective prevention may be blurry, which suggests that greater attention to the specific responses of LR and HR individuals is warranted. For example, Stice and Shaw defined selective programs as including those who

“implicitly screen” participants by advertising the program’s focus (e.g., body acceptance). This study used the type of implicit screen described by Stice and Shaw and targeted sorority women, viewed by some as a HR group. Thus, it might be considered a selective program. EDE-Q total scores, however, ranged from .06, indicating virtually no eating disorder pathology, to 4.59, suggestive of quite high eating pathology. Our EDE-Q global mean ( $M = 1.8$ ,  $SD = 1.1$ ) also was noticeably lower than that reported by Zabinski et al. ( $M = 3.0$ ,  $SD = 1.0$ ) in their selective prevention study (2001), suggesting that we did not exclusively target HR women.

This study has several limitations. First, results are limited by the use of self-report measures. Second, assignment was not fully random in that members who could not participate in year one for scheduling reasons were only randomized into the active conditions during year two. Third, despite largely random assignment, CD had higher mean scores at baseline. Although scores were not significantly higher than in the other two groups and we used analyses designed to control for baseline differences, it is conceivable that baseline differences influenced the results. We believe this is unlikely, however, because the magnitude of change often was quite similar between the two intervention groups. Fourth, although we believe that spillover was minimal between the two groups, this remains a possible confound. Fifth, results from the present study would be strengthened by the inclusion of a placebo control group to control for expectancy effects. A longer follow-up period also would strengthen this study.

This study suggests that reduction of eating disorder risk factors in LR and HR sorority women is possible using newer prevention techniques. Substantially longer follow-up is needed to determine whether or not eating disorders are actually prevented by programs such as the present one. Successful reduction of empirically supported risk factors such as internalization of

the thin-ideal and body dissatisfaction in sorority members is promising, however, given data suggesting that sorority members may be at somewhat increased risk for eating disorders.

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## Footnotes

<sup>1</sup> Because we believe it is difficult definitively state who is high- versus low-risk, and because risk status undoubtedly occurs on a continuum, we prefer the terms higher- and lower-risk to high- and low-risk.

<sup>2</sup> Sorority rosters from spring semester of the 1<sup>st</sup> year of the study indicated that total sorority membership was 350. Fall membership runs approximately 90 students less than spring membership because students join in the spring.

<sup>3</sup> According to the student affairs office of Trinity University, although the exclusive presence of local and non-residential sororities is somewhat unusual, most university Greek systems are relatively unique. We were unable to find any data regarding the frequency of national versus local sororities. To our knowledge, this data has not been collected.

<sup>4</sup> CD largely was based on the description published by Stice et al. (2000).

<sup>5</sup> Analyses conducted including the 12 excluded participants produced similar results to reported analyses.

Table 1

*Means and Standard Deviations for Total Sample*

Construct	Baseline	Termination	Follow-up	ITT	Completer
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	Effect Size <i>d</i>	Effect Size <i>d</i>
<b>Restraint</b>					
CD <sub>a</sub>	2.38 (1.02)	2.01 (1.11)	2.05 (1.12)	.31	.40
MP <sub>a</sub>	2.07 (.99)	1.83 (1.01)	1.76 (.92)	.31	.42
WL <sub>b</sub>	2.12 (.89)	1.96 (.87)	2.12 (1.02)	-.01	-.08
<b>Internalization</b>					
CD <sub>a</sub>	3.45 (.72)	3.18 (.71)	3.14 (.80)	.40	.45
MP <sub>ab</sub>	3.33 (.63)	3.17 (.66)	3.11 (.83)	.29	.36
WL <sub>b</sub>	3.31 (.61)	3.22 (.76)	3.22 (.70)	.14	.21
<b>ED Pathology</b>					
CD <sub>a</sub>	1.22 (.69)	.95 (.69)	.96 (.74)	.35	.44
MP <sub>a</sub>	.99 (.66)	.84 (.72)	.78 (.67)	.28	.41
WL <sub>b</sub>	1.00 (.62)	.95 (.58)	1.03 (.67)	-.06	-.11
<b>Dissatisfaction</b>					
CD <sub>a</sub>	2.67 (1.21)	2.19 (1.18)	2.21 (1.27)	.37	.45
MP <sub>a</sub>	2.38 (1.12)	2.03 (1.28)	1.89 (1.18)	.39	.52
WL <sub>b</sub>	2.40 (1.23)	2.33 (1.17)	2.39 (1.23)	.01	.01

*Note:* Cognitive Dissonance (CD) *n* = 57. Media Psychoeducation (MP) *n* = 56. Waitlist Control (WL) *n* = 36. ITT = Intent-to-treat. ED = Eating disorder. Groups with different subscripts were statistically significantly different over time ( $p < .05$ ). Cohen's *d* reported baseline to follow-up.