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Examining the Effect of a Body Image Cognitive Dissonance Prevention Program on
Disordered Eating, Risky Alcohol Use, and Sexual Risk Taking

A thesis submitted in partial fulfillment of the requirement
for the degree of Bachelor of Arts in Psychology from
The College of William and Mary

by

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Accepted for _____
(Honors, High Honors, Highest Honors)

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Meghan K. Brown

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Author Note

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Abstract

Eating disorders and body image issues are significant problems which affect many domains of the lives of both men and women. These constructs have, in turn, been associated with health risk taking behaviors such as sexual risk taking and risky alcohol use. Ninety-six participants completed self-report data before and after a body image cognitive dissonance (CD) program or an active health education control to determine if participation in the program lead to less health risk taking behaviors such as disordered eating, risky alcohol use and, and sexual risk taking. T-tests and ANOVA revealed that participants who went through Reflections training exhibited lower global Eating Disorder Examination Questionnaire (EDE-Q) and Alcohol Use Disorders Identification Test (AUDIT) scores, however did not differ on Sexual Risk Taking Scale (SRTS) scores. Future studies may require larger samples to address floor effects and may want to consider ways to improve random assignment in order to adequately assess whether cognitive dissonance training can be expanded to be used to lower risky health behaviors.

**Examining the Effect of a Body Image Cognitive Dissonance Prevention Program on
Disordered Eating, Risky Alcohol Use, and Sexual Risk Taking**

Eating disorders are associated with the highest mortality rate of all psychiatric disorders (Allison, 2010; Birmingham, Su, Hlynsky, Goldner & Gao, 2005) primarily through the impact of eating pathology on all domains of health, including social, mental, and physical functioning. Further, many college women report disordered eating attitudes, particularly body image concerns, and disordered eating behaviors, such as chronic dietary restraint, binge eating, and compensatory behaviors (Taylor et al., 2006), all of which influence quality of life and physical impairment in these women (Vannucci, et al., 2012). Of particular concern is that those endorsing body image concerns and features of disordered eating, as well as those with eating disorders, are more likely to abuse substances (e.g., tobacco, alcohol, amphetamines, cocaine, heroin, over-the-counter medications) and engage in risky sexual behaviors (e.g., reduced condom use, poor partner communication; Salazar et. al, 2004), leading to additional concerns about the health, safety, and well-being of these individuals. Given that 10% of college-aged women present with disordered eating or clinical eating disorders (Lewinsohn, Striegel-Moore & Seeley, 2000), and that these comorbid outcomes with alcohol use and sexual risk taking may be further exacerbated in college settings (e.g., alcohol use and sexual risk taking are particularly high in college students; Cooper, 2002; Desiderato & Crawford, 1995), it is important to address the complex associations among disordered eating, body image concerns, substance use, and sexual risk taking. The current study addresses this need by examining whether or not participants who receive an established cognitive dissonance preventative program which has been shown to improve body

image and reduce the risk of developing an eating disorder will also reduce the presence of other risky behaviors.

The History of Disordered Eating

Though the development of effective methods of preventing and treating eating disorders has been relatively recent, the disorders themselves have been categorized for decades in some cases and over a century in others. Concerning fasting behaviors and related attitudes, Leseque and Gull separately categorized Anorexia Nervosa first in 1873 (Bemporad, 1996), however, the history of disordered eating and dietary restraint stretches back through written history. For example, Bemporad makes note that there is no mention of purposeful self-starvation during the Dark Ages, which she attributes to the severe shortage of food during this time. Self-starvation only serves a psychological function when food is in short supply (Bemporad, 1996). Historians have noted a miniature epidemic of women engaging in self-starvation with similarities to our modern notion of anorexia between the 13th and 17th centuries. These women engaged in pious fasting to the point of death in reflection of individuals like St. Catherine of Sienna (Bemporad, 1996). In this age women turned to self-starvation to devote their lives to God and to avoid the troubles women faced such as pregnancy, childbirth, forced marriage, and compelled sexual relations. This use of self-starvation to exercise control over one's life as well as to gain freedom from societal expectations has a long history.

In the 17th and 18th century, the number of women engaging in "holy anorexia" decreased dramatically. During the Reformation people shifted towards a medical etiology of chosen starvation rather than a religious one. Medical professionals started to treat anorexic women as ill and also noted an emotional component of the disorders.

There were at least nine doctoral theses which discussed anorexia written between 1685 and 1770 (Bliss & Bruch, 1960). The first time that anorexia nervosa is considered to have been officially described was in 1873 when Leseque and Gull defined the condition by an onset of early adulthood, restlessness, cessation of the menstrual period (e.g., amenorrhea), and lack of concern for obvious malnutrition, most of which are markers of anorexia nervosa today. They both gave individuals exhibiting behaviors now associated with anorexia nervosa an optimistic diagnosis, with the suggestion that patients would recover with forced feeding and separation from family. We know today that this treatment is not effective, but the path to successful treatment has been a long one.

The theories that attempted to explain the etiology of disordered eating have changed significantly over the course of its studied history, culminating with increased public, clinical, and research interest in the 1980s, which were unofficially dubbed “the decade of the eating disorder” (Meadow & Weiss, 1992). At this time, treatment research emerged to address the inclusion of anorexia nervosa (AN) and bulimia nervosa (BN) in the Diagnostic and Statistical Manual of Mental Disorders (DSM) as well as to address the increase in patients seeking treatment, with an emphasis on cognitive behavioral therapy, family therapy, and psychotherapy. These are still used as methods of treatment today (Bemporad, 1996), however, given the extraordinary cost and resources necessary for treatment of someone with an eating disorder it is crucial that researchers discover effective methods of preventing these.

Current Research

In the last decade there has been a significant increase in the amount of psychological research conducted on disordered eating, body image, and eating disorders.

Across studies, it is evident that eating disorders cause significant and long-lasting negative changes to many domains of an individual's life. These changes include serious physical complications such as exhaustion, severe dehydration, osteoporosis, hair loss, growth retardations, loss of tooth enamel, gastrointestinal bleeding, and an increased risk of cardiac arrest (Allison, 2010; Chavez & Insel, 2007; Klump, Bulik, Kaye, Treasure, & Tyson, 2009). In addition to the increased risk of physical complications, women diagnosed with AN or BN are more likely to experience depression, anxiety, substance abuse disorders, impulsive behaviors and emotional instability (Chavez & Insel, 2007; Halmi, 2010; Klump et. al, 2009). Building on this, women with AN or BN are more likely exhibit social impairment, to rate their quality of life as low, and to attempt or complete suicide (Keel, 2010; Klump et. al, 2009; Stice & Fairburn, 2003). In sum, clinical eating disorders increase impairment in physical, mental, and social domains and reduce quality of life.

Further, even features of eating disorders, including body image concerns and/or sub-threshold disordered eating behaviors can have significant negative impacts on an individual's quality of life (Birmingham et al., 2005). Body image concerns stem from thin-ideal internalization, which is defined as the unrealistic, unattainable standard of female beauty prevalent on women in society. This internalization is linked to body dissatisfaction which can lead to dietary restraint and other disordered eating behaviors, all of which are precursors to clinical eating disorders (Becker, Smith, & Caio, 2006; Stice, Mazotti, Weibel, & Agras, 2000). Indeed, body image concerns, or body dissatisfaction, are considered robust risk factors for eating disorder onset in adolescent females such that this construct is a primary target in almost all prevention programs

(Becker, 2006; Becker, Bull, Schaumberg, Caube, & Franco, 2008; Becker, Wilson, Williams, Kelly, McDaniels, & Elmquist, 2010; Taylor et. al, 2006; Stice et. al, 2000; Stice, Shaw, Becker, & Rohde, 2008).

In addition, quality of life impairments associated with clinical eating disorders appear to extend to those reporting disordered eating attitudes and behaviors. For example, lowered self-esteem, levels of negative body image, and endorsement of the thin-ideal are highly correlated with disordered eating behaviors (Mintz, & Betz ,1988). Adolescents and young adults who report disordered eating behaviors also appear to report depression, negative affect, self-esteem problems, issues with loneliness and social isolation, and self-concept deficits (Jacobi, Paul, de Zwaan, Nutzinger, & Dahme, 2004; Sinton et al., 2012). Body image issues are also associated with high depressive symptoms and thoughts about or attempts of suicide (Eisenberg, Neumark-Sztainer, & Story, 2003). These associations are particularly salient during college because body image, weight and shape concern, and self-concept formation are especially intense during these years (Fitzsimmons-Craft, 2011). Together, this information suggests that impairment in the listed domains are associated with body image and disordered eating problems in young adult populations. Thus, individuals do not need to present with a clinical eating disorder to be affected by the psychological and physical consequences of low body image and disordered eating behaviors.

Prevention of Body Image and Disordered Eating

A goal of many prevention programs is to thus address disordered eating behaviors before they progress to clinical eating disorders and before additional risk behaviors emerge.

Indeed, due to the significant health risks and serious nature of all eating disorders, including subclinical behaviors, prevention programs are clearly important for at-risk populations (Birmingham et al., 2005; Chavez, & Insel, 2007). Fortunately, several recent studies provide evidence that effective programs for at-risk populations are feasible and effective (Sinton & Taylor, 2010).

Although all programs aim to reduce body image concerns and risk for disordered eating and eating disorder onset, body image and disordered eating prevention programs may utilize different approaches. For example, some prevention programs use *universal prevention*. These programs target the risk factors for developing eating disorders in an entire population. This is done regardless of a specific individual's risk level for developing disordered eating (Sinton & Taylor, 2010). In the case of eating disorders, these programs are valued because they can be disseminated to samples regardless of individual participants' risk factors. It should be noted, though, that these program can be difficult because of the growing public health concern for and fight against obesity, despite evidence that suggests that these programs may lead to healthy weight loss and a reduction in disordered eating in overweight and non-overweight youth (Goldschmidt, Aspen, Sinton, Tanofsky-Kraff, & Wilfley, 2008). Further, due to the relatively low rate of eating disorders and some eating disorder behaviors, it is often hard to evaluate the effectiveness of these programs. Thus universal programs for eating disorders are often not implemented and if they are, effectiveness is limited due to floor effects.

Given this limitation to universal programs, as well as the need to determine if programs are effective for those at risk for eating disorders, many prevention programs are *targeted* or *selected preventions*. These programs concentrate their efforts on those

individuals in a specific population who indicate a significantly higher probability of developing disordered eating habits (Sinton & Taylor, 2010). These programs have been evaluated as generally more effective than the universal programs because it is easier to detect significant changes to eating habits and self-concept across the targeted population than it would be with the universal population (Sinton & Taylor, 2010).

Other researchers, though, have focused on developing programs for individuals who are at the highest risk for eating disorder onset in the near future (e.g., already displaying some signs or features of clinical eating disorders). The final style of prevention is labeled *indicated prevention*, and targets individuals at a very high risk or threshold features of an ED. The differences between those in this category of prevention and the previous one are often very slight (Sinton & Taylor, 2010).

Cognitive Dissonance

One area of prevention which has received strong empirical attention and support in the past decade is cognitive dissonance training designed to decrease the risk factors for disordered eating like self-esteem issues. First postulated by Leon Festinger in 1957, cognitive dissonance theory (CD) states that when one has cognitions that are incongruous with one's personal beliefs there is psychological discomfort. In order to restore consistency people will alter their behavior or attitudes to alleviate this discomfort (Festinger, 1957).

Stice and colleagues used CD to develop a program in which high-risk female participants voluntarily rejected the thin-ideal by creating a body acceptance program for high school students over the course of three weekly, one hour sessions (2000). This voluntary rejection helps increase dissonance and to instill the rejection as a long-term

change. Further, as noted above, the onset of clinical and sub-clinical level eating disorders are strongly associated with excessive shape and weight concern (Taylor et al., 2006) and thin-ideal internalization (Stice et al., 2000) such that reductions in thin ideal internalization were expected to reduce body dissatisfaction and related disordered eating behaviors.

In 2006 Becker sought to replicate these findings. Results again supported the use of CD. Given a high level of interest in and support for the program among the sororities at Trinity University, Becker and colleagues continued to study the effect of CD on new members in the sorority community. Over time, in order to standardize and disseminate the program further, the Body Project became the Reflections program, which involved two two-hour sessions over two weeks (as opposed to three one hour sessions) delivered by peer leaders.

The *Reflections: Body Image Program* has been evaluated in several studies involving college-aged women, most of who were, for ease of recruitment and through support from national fraternity Delta Delta Delta, new members in sororities and who went through the program as part of their new member education. Participants in these studies, reported, at baseline, a range of risk for developing eating disorders, which means that both women with high and low thin-ideal internalization could go through the program (Becker et al., 2010). This is in contrast to the original study by Stice and colleagues (2000), which recruited women with elevated body image concerns. Becker and colleagues have consistently found that this program decreases the risk of disordered eating these women as defined by an excess of thin-ideal internalization, body dissatisfaction, maladaptive dietary restraint, bulimic pathology, and negative affect

(Becker et al., 2010). Indeed, the Reflections program, developed by Stice, Becker and their colleagues is considered by the American Psychological Association to be the first preventative programs to be efficacious at inhibiting the development of eating disorders (Becker et al., 2008; Stice, Shaw, Becker & Rohde, 2008; Becker et al., 2010; Sinton & Taylor, 2010).

Additional Risk Factors/Prevention Targets

Given that the Reflections program is considered efficacious, next steps include examining if and how this program reduces additional constructs associated with body image concerns and disordered eating in college women. As noted earlier, body image concerns and disordered eating, as well as eating disorders themselves, are associated with a host of psychosocial deficits, including risk taking behaviors such as risky sexual behaviors and inappropriate alcohol use (Chavez & Insel, 2007; Gillen, Lefkowitz, & Shearer, 2006; Keel et al., 2003).

Stice and colleagues have said previously that they believe that cognitive dissonance prevention programs could be extended to be used to prevent substance abuse and the spread of sexually transmitted infections (STIs; Stice et al., 2008); however this has not yet been attempted. CD may be a particularly effective method of chronic improvement in health behaviors because the dissonance poses a threat to perceived self-integrity (Stone & Focella, 2011). Examining if the risky health behaviors discussed above are reduced through participation in the Reflections program is an important next step. It may enhance the appeal and ease of dissemination of the program to a broader range of women as well as indicate additional areas for refinement of the Reflections. Programs which have positive impacts on multiple domains of health behaviors are

especially desirable because they save time and resources, and more efficient than those which do not. The current study examines the extent to which the Reflections: Body Image Program can be used to address risky behaviors associated with low body image particularly those which address sexual health and substance use in college women. Of note, examining these constructs is relevant as these specific health risk taking behaviors are found to be particularly high in young women. For example, twenty-five percent of new HIV cases are found in individuals under twenty years old; this rate likely reflects that thirteen percent of college students have had sex with two or more partners in the past twelve months, and fifty percent report that they do not use a condom during every session of sexual intercourse (American College Health Association, 2008). Additionally, almost of half (44%) of college students report binge consumption of alcohol, and nineteen percent report frequent binge drinking (Wechsler, Davenport, Dowdall, Moeykens & Castillo, 1994).

Of relevance to this study, these constructs appear highly associated with eating disorders, disordered eating, and body image concerns. For example, among women who died as a consequence of AN, one third of those who participated in comorbid alcohol abuse did not present with an alcohol use disorder at intake (Keel, Dorer, Eddy, Kamryn, Franko, Charatan, & Herzog, 2003). Additionally, behaviors associated with bulimia nervosa (e.g., binge eating, compensatory behaviors) are significantly associated with risky sexual intercourse, hazardous alcohol use, and suicide attempts. In both cases researchers believe that individuals with disordered eating patterns use these risk taking behaviors as means of coping with the consequences of the disordered behaviors (Chavez

& Insel, 2007; Conason & Sher, 2006; The National Center on Addiction and Substance Abuse (CASA) at Columbia University, 2003).

Further, women with lower self-esteem report that their weight concern, physical condition, and thoughts about the body during sexual activity all have an impact on how a woman experiences sex (Pujols, Meston, & Seal, 2009). Indeed, body image seems to have a significant impact on the sexual decision making process (Linde, Jeffery, Levy, Sherwood, Utter, Pronk & Boyle, 2004). In contrast, women at lower risk for disordered eating or for eating disorder onset (e.g., who report higher self-esteem and higher body image satisfaction) are less likely to engage in risky sexual behaviors (Gillen et al., 2006). Further a similar association for alcohol use in college women has been reported; college age women with body image concerns engage in more risky alcohol use (Gillen et al., 2006). Therefore, it is necessary to test programming which targets these domains simultaneously. As the Reflections program targets body image and has been associated with increases in self-esteem, it follows that it may be that CD is also associated with reductions in sexual risk taking and risky alcohol use in college women.

Summary

In sum, body image concerns and eating disorders appear in particularly high concentrations in college age women (Taylor et al., 2006). Similarly, the risk of excessive alcohol use and risky sexual behavior are also especially present during emerging adulthood (Cooper, 2002; Desiderato & Crawford, 1995). The higher occurrence of these behaviors in these age groups means that they are likely to co-occur. Indeed, the risk of this pattern of behaviors is greater as body image issues, risky alcohol use, and sexual risk taking have a relationship with one another (Gillen et al., 2006).

Because the risk for EDs and of sexual risk taking and alcohol abuse separately create a wide array of both physical and mental health concerns in young women such as amenorrhea, contraction of sexually transmitted infections, also known as STIs, or liver damage, the concerns associated with these consequences are compounded when the behaviors co-occur (Beadnell et al., 2005; Chavez & Insel, 2007; Klump et al., 2009).

Reflections has already been proven effective for lowering body image concerns (Becker et al., 2006; Becker et al., 2008; Becker et al., 2010), but now it is necessary to test if the program also addresses other unhealthy behaviors. If it addresses multiple health concerns, then it adds to the justification for the widespread dissemination of cognitive dissonance training on college campuses. If it does not address these concerns, then it shows a weakness of the program, and that other skills should be added into the CD training.

Given the body of evidence indicating that Reflections reduces the body dissatisfaction and negative affect associated with EDs, a vital next step is to examine whether the program reduces the occurrence of health risk behaviors highly prevalent among college women, particularly women at risk for eating disorders, such as sexual risk taking and alcohol abuse. Should researchers be able to find a way to treat several health risk taking behaviors at once such as substance abuse, unhealthy dieting or exercise behaviors caused by poor body image, and sexual risk taking, dissemination of programs could be simpler as well as more cost and time effective.

The current study

Current research shows that a multitude of health behaviors have a serious impact on college aged women (Birmingham et al., 2005; Chavez & Insel, 2007; Halmi, 2010;

Klump et. al, 2009). At this age some of these most relevant health risks that women face are poor body image, substance abuse, and sexual risk taking. (Chavez & Insel, 2007)The literature shows that these three are associated with each other, and the current study attempts determine if a CD program targeting body image concerns, which may underlie not only risk for disordered eating but also risky sexual and alcohol use behaviors in college women, is associated with reductions in sexual risk taking and risky alcohol use.

The purpose of this study is to 1) replicate previous findings associated with the Reflections program, specifically the decrease of dietary restraint, weight concern, shape concern, and eating concern through the implementation and evaluation of the program through the student participant pool at William and Mary and 2) to extend this work to examine the impact of the Reflections program on participants' health risk-taking behaviors. This study aims to determine through a short-term longitudinal study across the 2011-2012 academic year whether or not dissonance therapy decreases sexual risk-taking and unhealthy alcohol use in addition to a decrease in shape- and weight-concern.

It was hypothesized that the participants who received the Reflections program would report, over time, lower occurrences of unhealthy behaviors in comparison to participants in the active control group.

Method

Participants

Researchers recruited 96 female participants for this experiment through the SONA introductory psychology research pool. Average age was 18.47 years ($n=96$). Average body mass index (BMI) was 22.38. Participants were 59.3% Caucasian, 11.6%

Asian American, 11.6% African American, 8.1% Latina, 4.7% Multi-racial, and 4.7% unspecified. Additionally, 75.6% were freshmen, 17.4% were sophomores, 3.5% were juniors, and 3.5% were seniors. Because the program was originally distributed within a sorority community, researchers collected data on participants' membership in social Greek life. Participants reported that 24.4% were members of a social sorority, and 75.6% were not. All participants received credit towards their introductory psychology grades for participating in the experiment.

The participants were told that the study was looking at the health behaviors of college women, and could sign up for study timeslots, half of which were randomly assigned to be the experimental condition. Experimental participants partook in two, two-hour sessions of the Reflections program in its current form in addition to completing both pre and post-assessments. The remaining participants were placed in the active control group, which involved an activity related to general health behaviors which was designed to mirror the discussion-based nature of the experimental cognitive dissonance activity. This group was matched to the experimental group on time and contact with peer leaders. These individuals participated in two alternative two-hour sessions as well as the same assessments as the experimental group.

Materials

The program used for this study is the Reflections: Body Image Program which was developed by Becker and Stice and has been disseminated through the support of the Delta Delta Delta national fraternity (Becker & Stice, 2012). Reflections is a peer-led program that uses groups of 8-12 participants as well as 3 peer leaders who are trained in

implementing the discussion. Every participant had access to a Reflections: Body Image Program workbook, and every peer-leader had access to the workbook as well as a facilitator guide.

Procedures

After consenting to participate in the experiment, participants were invited to sign up for a timeslot to participate in their active session. These groups of ten participants each were then randomly assigned to either receive the experimental or active control procedure. Researchers collected post data from participants six weeks after their second program session.

Experimental Group Procedure. Before the session began a peer leader informed the participants that what was said during both sessions should be considered confidential, and should not be shared with individuals outside of the group. Participants engaged in a variety of activities and discussions designed to contrast the “thin-ideal”, or how women believe they must look according to the unrealistic messages they see in the media every day, with the “healthy-ideal”, or how women should strive to look and feel in a healthy manner. Before the end of the session participants were given an assignment for the next week in which they were asked to complete two activities designed to prolong and intensify the cognitive dissonance. For the second session peer leaders reviewed the activity that participants were asked to do in the week between sessions and participants as well as peer leaders discussed what it was like to engage in these activities. After this participants joined in several more activities that allowed them to practice rejecting the thin-ideal both in themselves and others for the remainder of the two hours.

Active Control Group Procedure. For this study, active control group participants engaged in an active alternative procedure which was designed to mimic the discussion-based nature of the Reflections: Body Image Program without having participants engage in discussions about body image, dieting behaviors, the media, or other subjects related to thin-ideal internalization. Participants first reviewed health brochures which were available to students through the campus Office of Health Education. These brochures were *Getting What You Want from Stress, Taking Care of Your Skin, Eating Vegetarian, Help on the Way: Flu*, and *5 Ways to be Active Every Day* (Baker, 1999; Edwards & Clark, 2007; Graff-Haight, 1998; Mueller & McNeely, 1998; Zimmerman, 1996). Participants were asked to take notes on the brochures and how well or poorly each conveyed information to women specifically. Following this the facilitator collected the notes and had the participants create a list of health resources available on campus. For the second session the facilitator re-copied the list from the previous week onto the board and had participants discuss each resource individually, and how that resource addresses women's health issues. Following this discussion participants were asked to discuss how the pamphlets that they had reviewed the previous week addressed women's health issues.

Measures

Participants provided self-report data on their age, year in college, race/ethnicity, affiliation with Greek life and athletic teams, as well as current height and weight in order to determine participants' body mass index (BMI).

Eating Disorder Examination Questionnaire (EDE-Q). The Eating Disorder Examination Questionnaire (EDE-Q) was developed by Fairburn and Beglin in 1994, and contains four subscales pertaining to eating restraint, eating concern, shape concern, and weight concern (see Appendix A). A global score is calculated using the mean of these subscales, with higher scores on the global scale indicating heightened levels of disordered eating attitudes and behaviors. Participants respond to questions like, “Have you gone on for long periods of time (8 waking hours or more) without eating anything at all in order to influence your shape or weight?” on a seven point likert scale. For this study the global EDE-Q scale and all of its subscales were found to be reliable on both pre and post-test data [$\alpha(84) = .73, .95$].

Alcohol Use Disorder Identification Test (AUDIT). The AUDIT is a 10-item questionnaire in which participants report on alcohol use behaviors that are associated with three different domains (see Appendix B; Saunders, Aasland, Babor, De La Fuente, & Grant, 1993). The domains are hazardous alcohol use, dependence symptoms, and harmful alcohol use (See Appendix B). These are assessed with questions like “How often during the last year have you had a feeling of guilt or remorse after drinking?” and, “How often during the last year have you been unable to remember what happened the night before because you had been drinking?” Participants can score from zero to forty on the AUDIT scale, with higher AUDIT scores indicating likelihood of risky alcohol use behaviors. The test has proven internally reliable and provides an accurate assessment of risk across gender, age, and culture (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). For this study the AUDIT was found to be reliable with high Cronbach’s Alpha levels [$\alpha(84) = .79, .85$] at baseline and follow-up, respectively.

Sexual Risk Taking Scale (SRTS). Sexual risk taking was assessed using established items from the *National Collegiate Health Assessment* (American College Health Association, 2008) and the *Sexual Risk Survey* (Breakwell & Millward, 1997). The scale was structured to correspond to the AUDIT in order to reduce differences in how risk behavior data were obtained for this study (See Appendix C). It contained questions like, “I had sex under the influence of drugs/alcohol,” and “I had sex with an untested partner. Scores could range from zero to forty with higher scores indicating greater sexual risk taking. For this study, internal reliability was $\alpha(84)=.85$ at baseline and $\alpha(84)=.83$ at follow up.

Analytic Plan

Descriptive statistics were conducted to obtain detailed information on the participant demographics for the whole sample and within each group. Outliers were defined as being two standard deviations above the mean for the mean score for that variable. Pearson correlations were conducted to examine associations among key study variables for the whole sample and within each group. T-tests and Multivariate Analysis of Variance (MANOVA) were used to examine the study hypotheses, which stated that groups would differ on change on EDE-Q scores, AUDIT scores, and SRTS scores over time. Paired t-tests were used to examine changes within each group on outcome variables. For all tests, $p \leq .05$ were considered significant. All analyses were conducted using SPSS version 19.0.

Results

Sample Overview

The final sample included eighty-six participants. Six participants had more than 60% data missing from their questionnaires, and four participants were excluded from analyses for having global EDE-Q scores two standard deviations above the sample average [$M(86)=1.20$, $SD=1.01$].

Demographic data for the final sample are presented in Table 1. Participants were 18-21 years old, primarily Caucasian, and were mostly freshmen in college. Mean scores on the EDE-Q suggested that participants endorsed low to moderate levels of weight concern, eating concern, shape concern, and dietary restraint, experiencing these concerns or behaviors on an average of 1-5 days out of the previous 28 days. On average, participants reported low risk drinking behaviors [$M= 3.23$, $SD=3.70$] with a range of 0-17 on the AUDIT scale. Sexual risk taking data suggested low risk sexual behaviors [$M=3.30$, $SD= 4.62$] with a range of 0-21 on the SRTS scale.

T-tests and chi-square analyses revealed that the experimental and active control groups did not differ on demographic data [$p > .05$]. However, groups did differ on total group size [Experiment $n=40$, Control $n=46$]. The experimental group participants had higher global EDE-Q scores than their control group counterparts [Figure 1; experimental $n=40$, $M=1.28$, control $n= 46$, $M=1.15$, $p>.05$]. Conversely, the control group reported higher occurrences of both alcohol risk taking [Figure 2; experimental $n=40$, $M=2.73$, control $n= 46$, $M=4.18$, $p>.05$] and sexual risk taking [Figure 3; experimental $n=40$, $M=2.35$, control $n= 46$, $M=4.13$, $p>.05$].

Associations Among Study Variables

Correlations were used to examine associations among study variables. At baseline, EDE-Q subscales were all correlated with one another [$r(84)=.54-.77, p<.05$]. Thus, as concern in one domain of disordered eating increased (e.g., weight concern, shape concern, eating concern, or dietary restraint), concern in other domains also increased. Sexual risk taking and alcohol use were significantly associated with one another such that as participants reported more risky alcohol use, reports of sexual risk taking also increased [$r(84)=.54, p<.05$]. The EDE-Q subscales and global score showed weak correlations with sexual risk taking [$r(84)=.12, p>.05$] and with risky alcohol use [$r(84)=.14, p>.05$].

Given that baseline differences between groups were present, additional correlations were conducted to determine if EDE-Q, AUDIT, and SRTS data had different associations with each other. For the experimental group, baseline data revealed alcohol risk taking was not significantly correlated with any subscales of the EDE-Q, $r(38)=.14-.24, p>.05$. Sexual risk taking was also not significantly correlated with any subscales of the EDE-Q, $r(38)=.01-.19, p>.05$. All subscales of the EDE-Q correlated with one another, $r(38)=.48-.92, p<.05$. Alcohol risk taking correlated strongly with sexual risk taking, $r(38)=.46, p<.05$.

As with the experimental group, in the active control group alcohol risk taking was not significantly correlated with any subscales of the EDE-Q, $r(44)=.03-.17, p>.05$. Additionally, sexual risk taking did not significantly correlate with any subscales of the EDE-Q, $r(44)=-.03-.11, p>.05$. Alcohol risk taking significantly correlated with sexual

risk taking, $r(44)=.57, p<.05$, and all subscales of the EDE-Q correlated with one another, $r(44)=.57-.94, p<.05$.

Similar correlation analyses were conducted within each group at follow-up. The experimental group reported no significant correlations in post data between sexual risk taking and either risky alcohol use or any subscales of the EDE-Q, $r(38)=-.15-.1, p>.05$. Risky alcohol use was also not significantly related to any EDE-Q subscales at follow-up, $r(38)=-.02-.05, p>.05$. EDE-Q subscales were all significantly correlated with one another, $r(38)=.53-.96, p<.05$.

Likewise, the active control group showed at follow-up that sexual risk taking was significantly correlated with risky alcohol use [$r(44)=.55, p<.05$], and the dietary restraint, shape concern, and global scales of the EDE-Q, $r(44)=.34-.50, p<.05$. All subscales of the EDE-Q were significantly correlated with one another, $r(44)=.55-.97, p<.05$. In contrast to the experimental group, risky alcohol use was significantly correlated with all subscales of the EDE-Q except for the weight concern scale, $r(44)=.35-.54, p<.05$.

Between Group Comparisons Over Time

MANOVA was used to examine differences on change scores between the groups over time on EDE-Q global scores, AUDIT scores, and SRTS scores. Change scores, calculated as pre-test mean score subtracted from the post-test scores, were used due to the differences present at baseline; it was decided that examining differences in patterns of change, as opposed to differences on mean scores, would be more appropriate.

Findings revealed a main effect for time [$F(3, 82) = 14.64, p < .001$] but not for group [p

= .13]. The interaction between time and group was not significant [$p = .17$]. Univariate tests revealed that there were significant differences on EDE-Q global change score and AUDIT change score, but not SRTS change scores over time (See Table 2).

The same analyses were used to examine differences between groups for change on the EDE-Q subscales. The same pattern emerged for the subscales; there was a significant main effect for time [$F(4, 81) = 9.19, p < .001$], with a significant decrease over time on all subscales. There was no main effect for group and the time x group interaction was not significant (See Table 3).

Within Groups Comparison Over Time

Paired samples t-tests were conducted to examine changes within the experimental group on pre and post-test data. The participants in the experimental group had significant decreases in global EDE-Q scores, $t(39)=4.39, p < .05$ over time. This pattern emerged for the EDE-Q subscales as well. Participants in the experimental group showed significant decreases on their scores for the restraint subscale, $t(39)=4.62, p < .05$, shape concern subscale, $t(39)=3.08, p < .05$, and the weight concern subscale, $t(39)=3.24, p < .05$ from pre to post-test. Change over time on the eating concern subscale were not significant, $t(39)=1.51, p = .14$ (See Figure 4). Further, risky alcohol consumption decreased significantly [$t(39)=3.51, p < .05$]. Sexual risk taking, though, did not change significantly over time [$t(39) = .07, p > .05$].

The same analyses were conducted for the active control group. The control group participants exhibited no significant differences between pre and post-data for the eating concern and weight concern subscales of the EDE-Q, $t(45)=1.27-1.48, p > .05$.

However, they did report significant differences in the dietary restraint and shape concern subscales, $t(45)=2.12-3.51, p<.05$ (See Figure 5). Overall, control group participants exhibited significantly lower global EDE-Q scores at follow-up, $t(45)=2.72, p<.05$. Control group participants did not differ significantly at post-testing on sexual risk taking scores, $t(45)=-.10, p>.05$, or on risky alcohol use, $t(45)=1.20, p>.05$.

Discussion

The current study examined the influence of a cognitive dissonance body image prevention program on a host of inter-connected health attitudes and behaviors in college women, a population at risk for a number of physical and mental health concerns. Specifically, the study focused on replicating previous research from Becker and colleagues (Becker et al., 2006; Becker et al., 2008; Becker et al., 2010) by examining if participants receiving this program exhibited reduced body image concerns and related disordered eating attitudes compared to women in an active health education control group. The second goal was to examine the effect of this program on college women's health by examining if participants in the cognitive dissonance program reduced sexual risk taking and risky alcohol consumption. These additional outcome variables were considered important to examine because of the high rates of sexual risk taking, onset of STIs, risky alcohol use and binge drinking in college women, as well as an emerging aggregate of research suggesting that body image concerns and these risk taking behaviors often co-occur. Given that this cognitive dissonance program is considered highly efficacious already (Sinton & Taylor, 2010), researchers determined to examine if the influence of the program went beyond reducing body image concerns, and could be extended into the reduction of other risks to health. It was hypothesized that the previous

findings by Becker and colleagues (2006; 2008; 2010) would be consistent in that body satisfaction would significantly decrease for the experimental group participants after they received Reflections. Additionally, researchers hypothesized that the program would also decrease unhealthy risk taking behaviors, specifically risky alcohol consumption and sexual risk taking behaviors.

Findings provided some support for study hypotheses pertaining to reductions in body dissatisfaction and risky alcohol use. Indeed, participants in the Reflections group did have significant reductions in body image concerns such as shape and weight concerns. However, it should be noted that there were also improvements in the active control group participants as well, such that groups did not significantly differ on change over time on weight concern, shape concern, dietary restraint, or eating concern. The improvements in this control group may reflect benefits associated with active controls as previous studies which involved active control groups showed improvements in the active control group participants (Stice, Burton, & Bearman, 2007; Stice, Shaw, Burton, & Wade, 2006; Stice, Marti, Spoor, Presnell, & Shaw, 2008). Further, participants in the Reflections group did have a significant reduction in risky alcohol use over time while participants in the control group did not significantly change on risky alcohol consumption over time; this is, to our knowledge, is the first study to report this outcome with this CD program. However, there was no change between groups on sexual risk taking. Sample size limitations, lack of variability and/or floor effects with some of the risk taking data, regression to the mean, and a range of unexpected and unintended baseline differences between groups also likely explain the lack of significant differences between the two groups over time. Despite these limitations, findings suggest that larger

scale studies may be warranted and that this program holds some promise for reducing certain risk taking behaviors.

Due to baseline differences between groups at the start of the study, additional analyses examined if associations among disordered eating and risk taking constructs also varied between groups in case it was that associations in and of themselves contributed to the lack of support for study hypotheses. Indeed there seemed to be some significant changes between groups in post data. At follow-up, associations between sexual risk taking and the dietary restraint, shape concern, and global scales of the EDE-Q were present among active control participants. Risky alcohol use was significantly correlated with sexual risk taking in addition to the dietary restraint, shape concern, eating concern, and global scales of the EDE-Q. This is in contrast to the experimental group, which did not exhibit this relationship at follow-up. There were different patterns at different time points of the study which may point to some additional effects of the program. This might be due to some of the reasons listed elsewhere in this discussion such as small sample sizes, imperfect randomization, unexpected third variables, and the short nature of the study.

The findings pertaining to significant change in risky alcohol use among CD but not active control are novel and suggest that findings for this program may extend to broader health outcomes in college women. Findings suggest that it is important to understand processes that underlie this pattern of change and lend support to previous studies which suggest that these constructs may be associated. The AUDIT scores in the experimental group were lower at follow-up than the control group counterparts. This suggests a decrease over time in risky drinking behaviors. These findings are in line with previous

studies in which relatively brief programs such as online alcohol education modules (Bersamin, Paschall, Fearnow-Kenney, & Wyrick, 2007; Carey, Scott-Sheldon, Carey, & DeMartini, 2007) have resulted in decreases in risky alcohol use in college students. Although causal conclusions cannot be made, continued examination is warranted in order to further understand how this program may influence this aspect of risk taking in college women.

Findings from this study add to a growing body of work which suggests that Reflections is relevant to reducing a range of disordered eating risk factors. In the current study, results revealed that participants in both the experimental and active control groups were less likely to report experienced body dissatisfaction as defined by the subscales of the EDE-Q after exposure to either the CD program, or the health education control program. The short-term nature of this study suggests a reduction in these concerns, though long-term data would be necessary to reveal how effective the programs are chronically, as other studies looked at longer term longitudinal data (Becker et al., 2006; Becker et al., 2008; Becker et al., 2010). However, in this experiment there are several modifications to the study design which differ from studies by Becker and colleagues that may explain these differences.

The current study has a smaller sample size compared to Becker's studies, and the smaller sample may have limited the ability to detect differences over time. This study also only used post-test data, not long-term follow up data and it may be that differences emerge over longer periods of time. Indeed, many of the robust findings for Becker and colleagues come from the long-term, not short-term findings; the role for long-term

follow up data may also explain, in part, some of the limited findings for the risk taking constructs.

Of interest, although the improvements noted in the active control were not hypothesized to be significant, they are also not completely surprising. Indeed, it should be mentioned that in recent studies Becker, Stice, and colleagues have noted some success for their active control groups in terms of reducing body image concerns as defined by body dissatisfaction (Stice et al., 2007; Stice, et al., 2006; Stice, et al., 2008). It may be that simply actively engaging in topics related to health, seeking assistance with body image concerns within a college setting, and/or discussing women's health with a group of peers leads to reduced body image concerns regardless of the framework of the discussion. In other words, the findings pertaining to the active control group are, to an extent, not unsupported when these previous findings are considered. Continued examination of how and why some other programs outside of CD are also successful may be warranted.

Of note, the current study differed from those conducted by Becker and colleagues in that they worked almost exclusively within the sorority community at her institution in order to gather data from participants. The program has been extended to use in other groups of women, but had not yet been tested in randomly assigned groups. Indeed, it may be that delivery of the program to groups of women who have regular, consistent, supportive contact with one another is an important, but unstudied, aspect of the program's long-term success.

In addition, the current study used the EDE-Q to assess thin-ideal internalization and body image concerns in order to expand on previous studies by using the brief self-report version of the gold standard clinical interview for eating disorder assessment (Fairburn & Beglin, 1994). Becker and colleagues, though, used the *Dutch Restrained Eating Scale* (DRES), the qualitative bulimic pathology questions from the EDE-Q, the *Ideal-Body Stereotype Scale-Revised* (IBSS-R), and the *Body Shape Questionnaire* (BSQ) to assess the effectiveness of the program. It may be that these differences in measurement explain discrepancies in findings. It will be important to conduct a larger assessment, with a larger sample and longer follow-ups, using all of these measures and to conduct longer-term follow-up data collection.

It is important to note that the limited findings from the current study may also result from regression to the mean for both groups of participants. The results may not be entirely dependent on the program administered, but third variables such as the time of the semester or testing effects could have had significant impacts on the results. Present findings stem from a range of unanticipated baseline differences on all key variables at baseline between the groups. Although randomization should have minimized these differences, the relatively small sample size likely reduced the chance for randomization to work. Becker and colleagues report no differences between groups at baseline in their studies, in contrast to the present experiment.

In this study, it appears that all participants experienced reductions in body dissatisfaction. This may be due to the possibility that participants in both groups were experiencing certain heightened behaviors due to multiple changes that occur at the start of the college experience and that these reduced over the seven weeks of the study.

Indeed, data were collected shortly after Fall Break, and then once again during the finals period when it may be that behaviors were more susceptible to changes due to transitions from school to home and back, the stress of exams, and the upcoming holiday season. For example, it may be that body image concerns were particularly high during midterms, or that they may have emerged as a result of a trip home. Additionally, regression towards the mean may have had an impact on all domains of risky behaviors. The pressure to define oneself is high at the start of college, and lessens as the semester goes on. Risky sexual behaviors and alcohol use may be more extreme when young adults are separated from their parents at first, and then level out after several weeks or months.

Randomization was difficult as a result of the recruitment system used to enroll participants in the program. In addition to this, the sample size of this study was quite small. This was the result of several constraints. The participant pool drew from mostly freshmen students, which limited variability in the alcohol use data at baseline and follow-up which limits interpretation and may not be broadly representative of college women's alcohol use. The same concerns are relevant to the SRT data which had relatively low variability. This low variability was a result of floor effects of young participants not having engaged in the risk taking behaviors being studied before the start of the current experiment. Though many individuals have engaged in sexual experiences and/or alcohol consumption before college, those who have not often engage in those events in a university setting (Cooper, 2002; Desiderato & Crawford). In future studies it would be beneficial to diversify the participant ages and years in school in the sample, and to follow up with the participants over a longer period of time in order to balance the floor effects. Baseline differences, as well as generally low levels of risk taking, suggest

that larger sample sizes are necessary to make a definitive assessment of CD body image programs' effects on health risk taking behaviors.

The lack of significant findings in the current study does not suggest that the Reflections program does not have an impact. What is clear, though, is that future studies will require greater attention to floor effects for alcohol use and sexual risk taking and may need to consider a different approach to assessing or analyzing these data (e.g., comparing the presence and absence of specific behaviors) with larger samples. It may also be important to assess the frequency and quality of contact among group members not only during the study but outside the sessions over time. It may be important to find ways to create support among participants outside of the sessions through either reunion type activities, or by using populations who inherently have support and contact regularly. Given that STIs, sexual risk taking, risky substance use, and body image concerns as well as eating disorders impact college women at high rates and may be associated with one another then it remains imperative to determine approaches that efficiently address these outcomes.

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Table 1.

Participant demographics for whole sample and by experimental group

	Full Sample (n= 86)	Experiemntal (n= 40)	Control (n= 46)
Age	18.47 (.94)	18.45(.90)	18.48(.98)
BMI	22.38 (4.01)	22.06(2.93)	22.66(4.78)
<i>PRE-test</i>			
Baseline EDE- Q Global	1.21 (1.01)	1.28(1.05)	1.15(.99)
Restraint	1.26 (1.40)	1.45(1.55)	1.10(1.24)
Eating	.65 (1.02)	.54(.77)	.50(.82)
Shape	.52(.80)	1.71(.1.24)	1.66(1.24)
Weight	1.68(1.23)	1.42(1.28)	1.32(1.24)
AUDIT	3.23(3.70)	2.73(3.02)	3.67(4.18)
SRTS	3.30(4.65)	2.35(4.20)	4.13(4.86)
<i>Post test</i>			
EDE-Q Global	.84(.85)	.78(.82)	.90(.88)
Restraint	.63(.89)	.58(.85)	.68(.92)
Eating	.40(.62)	.41(.63)	.40(.62)
Shape	1.32(1.23)	1.23(1.19)	1.40(1.28)
Weight	1.02(1.09)	.89(1.05)	1.14(1.12)
AUDIT	2.14(3.51)	1.20(2.34)	3.00(4.13)
SRTS	3.33(4.54)	2.33(3.66)	4.20(5.07)

NOTE. EDE-Q= Eating Disorder Examination Questionnaire, Restraint= Dietary

Restraint Subscale, Eating= Eating Concern Subscale, Shape= Shape Concern Subscale,

Weight= Weight Concern Subscale, AUDIT=Alcohol Use Disorder Identification Test,

andSRTS= Sexual Risk Taking Scale.

Table 2.

Multivariate Analyses of Variance between groups on AUDIT, SRTS, and global EDE-Q scores over time.

Effect			<i>Value</i>	<i>df</i>	<i>F</i>	<i>p</i>
Between						
Subjects						
	Intercept	Pillai's	.64	4	36.10	.00
		Trace				
	Group	Pillai's	.02	4	.33	.86
		Trace				
Within						
Subjects						
	Time	Pillai's	.31	4	9.19	.00
		Trace				
	Time x	Pillai's	.07	4	1.58	.19
	Group	Trace				

Note : AUDIT= Alcohol Use Disorder Identification Test, SRTS= Sexual Risk Taking Scale, EDE-Q= Eating Disorder Examination Questionnaire.

Table 3.

Multivariate Analyses of Variance within groups on EDE-Q subscale scores over time.

Effect		<i>Value</i>	<i>Df</i>	<i>F</i>	<i>p</i>	
Between						
Subjects						
	Intercept	Pillai's	.65	3	49.92	.00
		Trace				
	Group	Pillai's	.07	3	1.91	.13
		Trace				
Within						
Subjects						
	Time	Pillai's	.35	3	14.64	.00
		Trace				
	Time x	Pillai's	.06	3	1.72	.17
	Group	Trace				

Note : EDE-Q= Eating Disorder Examination Questionnaire. EDE-Q subscales are dietary restraint, eating concern, shape concern, and weight concern.

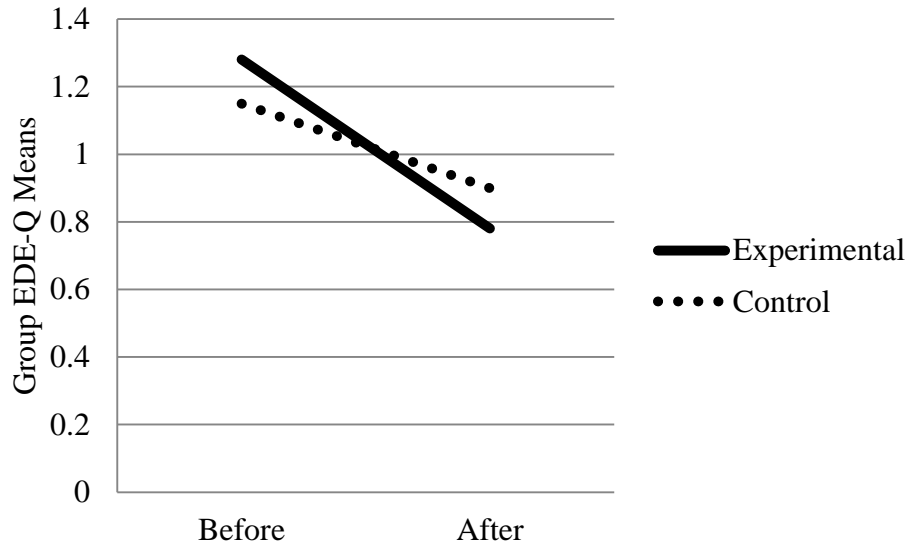


Figure 1. Global eating disorder examination questionnaire (EDE-Q) score changes over time. This graph compares global body dissatisfaction before and after intervention as measured by the global score on the EDE-Q. Both the experimental and control groups had significantly lower scores at follow-up.

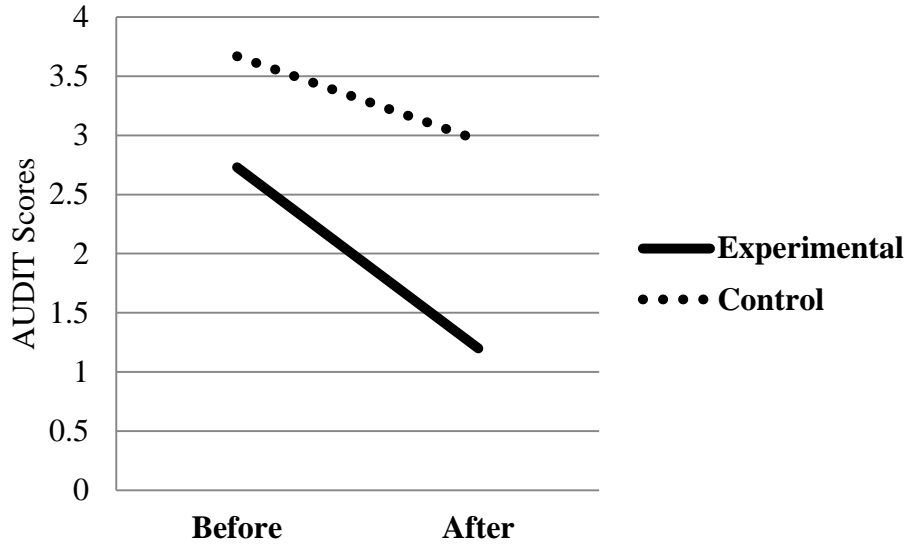


Figure 2. Alcohol Use Disorder Identification Test score changes by group. This figure shows a comparison between groups of risky alcohol use before and after intervention measured using the AUDIT scale

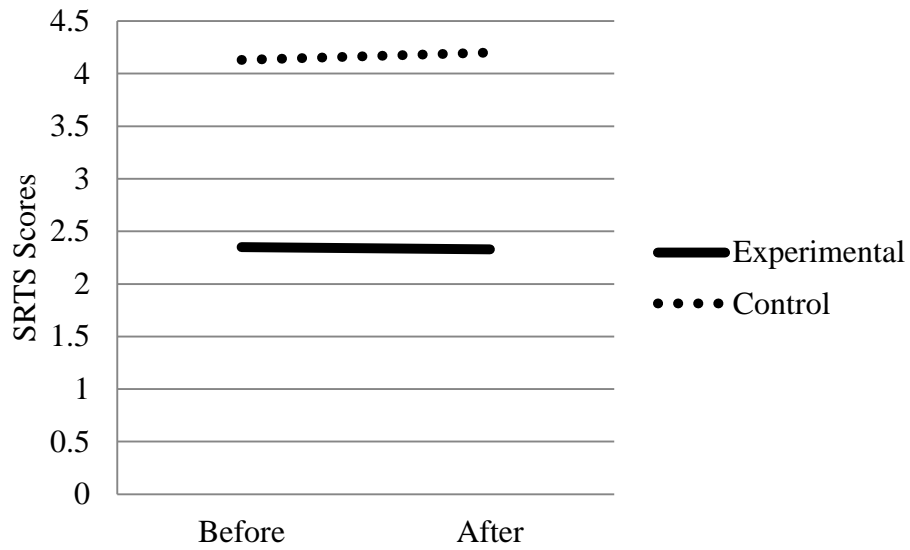


Figure 3. Sexual Risk Taking score change between groups. This figure shows a comparison of sexual risk taking before and after intervention as measured by the Sexual Risk Taking Scale. Neither group significantly decreased after intervention.

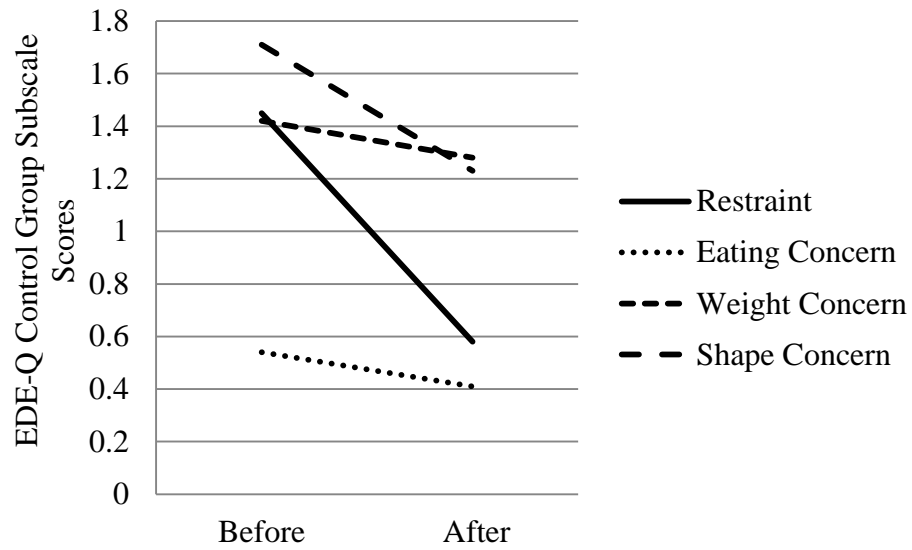


Figure 4. EDE-Q subscale score changes over time in the experimental group. The experimental group showed significant decreases for the restraint, shape concern, and weight concern subscales. Decreases on the eating concern subscale were not significant.

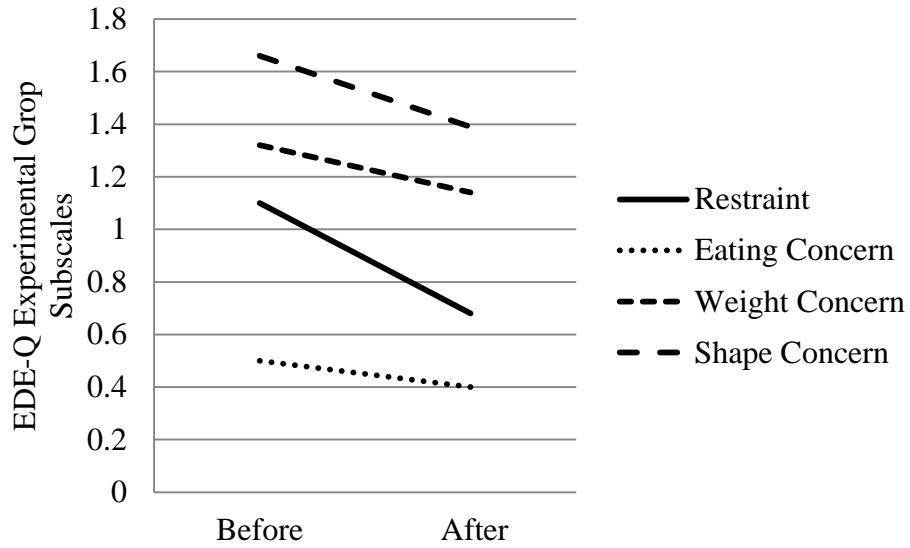


Figure 5. EDE-Q subscale change over time for the active control group participants.

There were no significant decreases for the eating concern and weight concern subscales, however, there were significant decreases for the dietary restraint and shape concern subscales.

Appendix A

Eating Disorder Examination Questionnaire

The following questions deal with the past four weeks (28 days) ONLY.

On how many of the past 28 days...

0	1	2	3	4	5	6
No Days	1-5 Days	6-12 Days	13-15 Days	16-22 Days	23-27 Days	Every Day

1. Have you been deliberately trying to limit the amount of food you eat to influence your shape or weight (whether or not you have succeeded)?

0	1	2	3	4	5	6
No Days	1-5 Days	6-12 Days	13-15 Days	16-22 Days	23-27 Days	Every Day

2. Have you gone on for long periods of time (8 waking hours or more) without eating anything at all in order to influence your shape or weight?

0	1	2	3	4	5	6
No Days	1-5 Days	6-12 Days	13-15 Days	16-22 Days	23-27 Days	Every Day

3. Have you tried to exclude from your diet any foods that you like in order to influence your shape or weight (whether or not you have succeeded)?

0	1	2	3	4	5	6
No Days	1-5 Days	6-12 Days	13-15 Days	16-22 Days	23-27 Days	Every Day

4. Have you tried to follow definite rules regarding your eating (for example, a calorie limit) in order to influence your shape or weight (whether or not you have succeeded)?

0	1	2	3	4	5	6
No Days	1-5 Days	6-12 Days	13-15 Days	16-22 Days	23-27 Days	Every Day

5. Have you had a definite desire to have an empty stomach with the aim of influencing your shape or weight?

0	1	2	3	4	5	6
No Days	1-5 Days	6-12 Days	13-15 Days	16-22 Days	23-27 Days	Every Day

6. Have you had a definite desire to have a totally flat stomach?

0	1	2	3	4	5	6
No Days	1-5 Days	6-12 Days	13-15 Days	16-22 Days	23-27 Days	Every Day

7. Has thinking about food, eating or calories made it very difficult to concentrate on things you are interested in (for example, working following a conversation, or reading)?

0	1	2	3	4	5	6
No Days	1-5 Days	6-12 Days	13-15 Days	16-22 Days	23-27 Days	Every Day

8. Has thinking about shape or weight made it very difficult to concentrate on things you are interested in (for example, working following a conversation, or reading)?

0	1	2	3	4	5	6
No Days	1-5 Days	6-12 Days	13-15 Days	16-22 Days	23-27 Days	Every Day

9. Have you had a definite fear of losing control over eating?

0	1	2	3	4	5	6
No Days	1-5 Days	6-12 Days	13-15 Days	16-22 Days	23-27 Days	Every Day

10. Have you had a definite fear that you might gain weight?

11. Have you felt fat?

0	1	2	3	4	5	6
No Days	1-5 Days	6-12 Days	13-15 Days	16-22 Days	23-27 Days	Every Day

12. Have you had a strong desire to lose weight?

Please fill in the appropriate number in the boxes below.

Over the past four weeks (28 days)...

13. Over the past 28 days, how many times have you eaten what other people would regard as an unusually large amount of food (given the circumstances)?

14. On how many of these times did you have a sense of having lost control over your eating (at the time that you were eating)? _____

15. Over the past 28 days, on how many days have such episodes of overeating occurred (i.e.: you have eaten an unusually large amount of food and have had a sense of loss of control at the time)? _____

16. Over the past 28 days, how many times have you made yourself sick (vomit) as a means of controlling your shape or weight? _____
17. Over the past 28 days, how many times have you taken laxatives as a means of controlling your shape or weight? _____
18. Over the past 28 days, how many times have you exercised in a driven or compulsive way as a means of controlling your weight, shape or amount of fat, or to burn off calories? _____

Please note: for the following questions the term "binge eating" means eating what others would regard as an unusually large amount of food for the circumstances, accompanied by a sense of having lost control over eating.

19. Over the past 28 days, on how many days have you eaten in secret (i.e.: furtively)?

Do not count episodes of binge eating.

0	1	2	3	4	5	6
No Days	1-5 Days	6-12 Days	13-15 Days	16-22 Days	23-27 Days	Every Day

20. On what proportion of the times that you have eaten have you felt guilty (felt that you've done wrong) because of it's effect on your shape or weight

Do not count episodes of binge eating

0	1	2	3	4	5	6
None of the times	A few of the times	Less than half	Half of the times	More than half	Most of the time	Every time

21. Over the past 28 days, how concerned have you been about other people seeing you eat?

Do not count episodes of binge eating.

0	1	2	3	4	5	6
Not at all		Slightly		Moderately		Markedly

Over the past 28 days...

22. Has your weight influenced how you think about (judge) yourself as a person?

0	1	2	3	4	5	6
Not at all		Slightly		Moderately		Markedly

23. Has your shape influenced how you think about (judge) yourself as a person?

0	1	2	3	4	5	6
Not at all		Slightly		Moderately		Markedly

24. How much would it have upset you if you had been asked to weigh yourself once a week (no more or less often) for the next four weeks?

0	1	2	3	4	5	6
Not at all		Slightly		Moderately		Markedly

25. How dissatisfied have you been with your weight?

0	1	2	3	4	5	6
Not at all		Slightly		Moderately		Markedly

26. How dissatisfied have you been with your shape?

0	1	2	3	4	5	6
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Not at all		Slightly		Moderately		Markedly
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27. How uncomfortable have you felt seeing your body (for example, seeing your shape in the mirror, in a shop window reflection, while undressing or taking a bath or shower?)

0	1	2	3	4	5	6
Not at all		Slightly		Moderately		Markedly

28. How uncomfortable have you felt about others seeing your shape or figure (for example, in communal changing rooms, when swimming, or wearing tight clothes)?

0	1	2	3	4	5	6
Not at all		Slightly		Moderately		Markedly

Please answer the following questions as honestly and accurately as possible.

29. Over the past 3-4 months, have you missed any menstrual periods?

30. If so, how many? _____

31. Are you using a hormonal method of birth control?

Appendix B

Alcohol Use Disorder Identification Test

1. How often do you have a drink containing alcohol?

Never	Monthly or less	Two to four times a month	Two to three times a week	Four or more times a week
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2. How many drinks containing alcohol do you have on a typical day when you are drinking?

1 or 2	3 or 4	5 or 6	7 to 9	10 or more
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3. How often do you have six or more drinks on one occasion?

Never	Less than monthly	Monthly	Weekly	Daily or almost daily
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4. How often during the last year have you found that you were not able to stop drinking once you had started?

Never	Less than monthly	Monthly	Weekly	Daily or almost daily
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5. How often during the last year have you failed to do what was normally expected from you because of drinking?

Never	Less than monthly	Monthly	Weekly	Daily or almost daily
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6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?

Never	Less than monthly	Monthly	Weekly	Daily or almost daily
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7. How often during the last year have you had a feeling of guilt or remorse after drinking?

Never	Less than monthly	Monthly	Weekly	Daily or almost daily
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8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?

Never	Less than monthly	Monthly	Weekly	Daily or almost daily
-------	-------------------	---------	--------	-----------------------

9. Have you or someone else been injured as a result of your drinking?

No	Yes, but not in the last year	Yes, during the last year
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10. Has a relative or friend, or a doctor or other health worker been concerned about your drinking or suggested you cut down?

No	Yes, but not in the last year	Yes, during the last year
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Procedure for Scoring AUDIT

Questions 1-8 are scored 0, 1, 2, 3 or 4. Questions 9 and 10 are scored 0, 2 or 4 only. The response coding is as follows:

	0	1	2	3	4
Question 1	Never	Monthly or less	Two to four times per month	Two to three times a week	Four or more times per week
Question 2	1-2	3 or 4	5 or 6	7-9	10 or more
Question 3-8	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
Question 9-10	No		Yes, but not in the last year		Yes, during the last year.

The minimum score (for non-drinkers) is 0 and the maximum possible score is 40.

A score of 8 or more indicates a strong likelihood of hazardous or harmful alcohol consumption.

Appendix C

Sexual Risk Taking Scale

Please indicate how often during the past year the following have occurred.

1. I engaged in sexual behavior with a partner I didn't know well

Never	Less than monthly	Monthly	Weekly	Daily or almost daily
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2. I was so drunk/high that I couldn't control my sexual behavior

Never	Less than monthly	Monthly	Weekly	Daily or almost daily
-------	-------------------	---------	--------	-----------------------

3. I engaged in vaginal intercourse without using a condom.

Never	Less than monthly	Monthly	Weekly	Daily or almost daily
-------	-------------------	---------	--------	-----------------------

4. I engaged in oral sex without a condom.

Never	Less than monthly	Monthly	Weekly	Daily or almost daily
-------	-------------------	---------	--------	-----------------------

5. I engaged in anal sex without a condom

Never	Less than monthly	Monthly	Weekly	Daily or almost daily
-------	-------------------	---------	--------	-----------------------

6. I had sex with someone I didn't know well

Never	Less than monthly	Monthly	Weekly	Daily or almost daily
-------	-------------------	---------	--------	-----------------------

7. I had sex under the influence of drugs/alcohol

Never	Less than monthly	Monthly	Weekly	Daily or almost daily
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8. I had sex with an untested partner.

Never	Less than monthly	Monthly	Weekly	Daily or almost daily
-------	-------------------	---------	--------	-----------------------

9. How many partners have you engaged in sexual behavior with?

10. How many partners did you engage in sexual intercourse with?

How to score the SRTSS:

Questions 1-8: Never: 0 Less than Monthly: 1 Monthly: 2 Weekly: 3 Daily or Almost Daily: 4	Questions 9 and 10: 0=0 1-3: 1 3-5: 2 5-7: 3 7 or more: 4
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A score of 8 or more indicates risky sexual behavior.