REDUCING THE RISK OF DISORDERED EATING AMONG FEMALE COLLEGE
STUDENTS: A TEST OF ALTERNATIVE INTERVENTIONS

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The purpose of this study was to test the effectiveness of a cognitive-dissonance based intervention in reducing disordered eating attitudes and behaviors. The intervention program created dissonance through discussion, exercises, and homework aimed at addressing and countering internalized sociocultural pressures, beliefs and values about women's bodies, attractiveness, and worth in the U.S. Seventy-seven female undergraduates were randomly assigned to one of four conditions: cognitive-dissonance, combined cognitive-dissonance, healthy weight placebo control, and wait-list control. To determine effectiveness of the intervention, MANCOVA procedures were used, with Time 1 scores serving as the covariate. Overall, the women who received the dissonance based interventions produced the strongest effects among measures assessing sociocultural pressures, internalization, and body dissatisfaction in comparison to the control group, and experienced significant reductions in dieting behaviors and bulimic symptoms over the course of the study, suggesting that the creation of dissonance via the intervention assisted the women in reducing eating disorder risk factors.

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CHAPTER 1

INTRODUCTION*

Etiological models of eating disorders are multidimensional, including sociocultural, developmental, psychological, environmental, familial, and biological factors (Mussell, Binford, & Fulkerson, 2000). Even so, most researchers acknowledge the central role that sociocultural factors play in their development (Striegel-Moore & Bulik, 2007). The pursuit and internalization of societal ideals of thinness (the “thin ideal”) may be attributable in part to repeated exposure to messages, communicated by family, friends, and the media, that glamorize and glorify excessive thinness (Irving, 1990; Stice, Schupak-Neuberg, Shaw, & Stein, 1994). Women may become dissatisfied with their bodies as they compare themselves to these unrealistic and unattainable societal body ideals (Brownell, 1991), and then react to this dissatisfaction in one (or both) of two specific ways. For some women, because physical appearance strongly influences their self-evaluation and emotional state, body dissatisfaction can lead to feelings of sadness, guilt, shame, depression, anxiety, and hostility. To cope with and distract themselves from these negative emotions, these women may binge eat; that is, eating becomes a salve for their affective distress (Stice, 2001). Other women may react to their body dissatisfaction by increasing their efforts to diet in an attempt to alter physical size to more closely approximate the societal thin-ideal. Because of the extensive caloric restriction and the inability to maintain the necessary cognitive restraint,

* This chapter is an abbreviated introduction formatted for journal entry. The complete Introduction can be found in Appendix A.

these women may end up binge eating or they may continue to engage in dietary restraint. Whether caused by negative affect or extreme dietary restraint, the binge eating may be followed by purging, which sets up the cycle that is the foundation of bulimia nervosa.

Eating disorders are most prevalent among girls and women and are associated with comorbidity and psychosocial impairment, can result in serious medical complications, and have a high mortality rate (Dietz, 1998; Hoek & Van Hoeken, 2003; Wilson, Becker, & Heffernan, 2003). In many Westernized countries, the incidence of anorexia nervosa (AN) and bulimia nervosa (BN) has drastically increased among adolescents and young women over the last decade (Kurth, Krahn, & Nairn, 1995; Owen & Laurel-Seller, 2000; Prouty, Protinsky, & Canady 2002). According to a report in the New England Journal of Medicine (Becker, Grinspoon, & Klibanski, 1999), eating disorders affect an estimated 5 million Americans every year, with female adolescents and young adults comprising the majority of cases.

Although clinically diagnosed eating disorders have been found in one to two percent of the female population, the prevalence of subclinical eating disorders is much higher affecting up to 60% of adolescent and college-aged females (Austin, 2000; Holston & Cashwell, 2000; Mintz & Betz, 1988; Shisslak, Crago, & Estes, 1995; Stice & Peterson, 2007). At any point in time, 40-45% of girls and young women are trying to lose weight through various means motivated by “normative” body dissatisfaction (French, Story, & Neumark-Sztainer, 1997; Striegel-Moore, Silberstein, & Rodin, 1986). Further, approximately 90 % of individuals who present for eating disorder treatment are female (Lewinsohn, Striegel-Moore, & Seeley, 2000; Mussell, Binford, & Fulkerson,

2000; Stice, Killen, Hayward, & Taylor, 1998), and prevalence rates are much higher among female college students than in the general population or among men (Dancyger & Garfinkel, 1995).

Longitudinal studies have shown that women in college are more likely to identify themselves as overweight, report higher body dissatisfaction, and be at greater risk to engage in disordered eating than women who are not (Heatherton et al., 1997; Vohs, 2001). Moreover, many college students experiencing disordered eating behaviors doubt their symptoms warrant treatment and thus do not pursue therapy (Becker, Franko, Nussbaum, & Herzog, 2004; Meyer, 2005). In fact, research has suggested that less than a third of individuals with eating disorders seek treatment (Fairburn et al., 2000; Johnson et al., 2002), and that the emergence of mental illness, including disordered eating, in late adolescence may have more serious and long-lasting consequences than at other stages of life (Currin & Shmidt, 2005). Given the significant medical and psychological implications that can co-occur with eating disorders, such as depression, dehydration, and cardiac problems, (Wilson, Becker, & Heffernan, 2002) and the increased risk for disordered eating within the college student population, efforts are needed to better understand their etiology and intervene before the development of clinical symptoms.

Initial prevention programs for eating disorders consisted primarily of didactic psychoeducation and were usually aimed at adolescents (Carter, Stewart, Dunn, & Fairburn, 1997; Moreno & Thelen, 1993). Although the first intervention programs had good intentions, they were not entirely effective in reducing eating pathology (Stice & Shaw, 2004). The second phase of eating disorder prevention programs were didactic in

format too but also provided information on resisting sociocultural pressures of thinness and offered suggestions for healthy weight-control methods (Neumark-Sztainer, Butler, & Palti, 1995). These programs were developed under the premise that sociocultural pressures were extremely important in the development of eating disorders and that extreme dieting and compensatory behaviors emerged as a result of trying to meet “appropriate” cultural standards of weight.

The third wave of interventions, which reflects the most recent and successful efforts aimed towards reducing eating disorder symptomatology (Stice et al., 2008), include selective programs that target high-risk individuals with interactive exercises that focus on risk factors (e.g., internalization, body dissatisfaction) that have been shown to predict the onset of eating pathology. These programs (a) are offered to high-risk individuals because they may be more willing to commit to the intervention due to their high levels of distress and because they are most likely to evidence change as a result of the treatment (Stice, Mazotti, Wiebel, & Agras, 2000; Stoolmiller, Eddy, & Reid, 2000), and (b) utilize interactive exercises and homework to apply and integrate the skills taught in the intervention (Stice & Shaw, 2004). Further, college students are an ideal group to target for such interventions because eating pathology is most likely to emerge during this time of life (Lewinsohn, 2000; Stice, Killen, Hayward, & Taylor, 1998), and because programs are most effective when delivered during the period in which eating disorder symptoms are emerging (Maggs, Schulenberg, & Hurrelmann, 1996).

In a meta-analysis of eating disorder prevention and intervention programs, Stice and Shaw (2004) found that 53% of the interventions resulted in significant reductions in

at least one established risk factor for eating pathology, such as body dissatisfaction. In addition, most of the programs that reduced eating pathology did so by focusing the intervention on the previously established psychosocial risk factors, such as internalization and negative affect. This meta-analysis found that program content is less important in producing positive outcomes than are features of the participants studied (e.g., high risk body dissatisfied women versus all women) and the intervention design (e.g., use of an interactive versus didactic format). In fact, the content for the programs that produced positive results varied significantly, including programs that focused on promoting self-esteem, healthy weight-control behaviors, and a critical analysis of the thin-ideal (which is hypothesized to create cognitive dissonance that leads to symptom reduction). Overall, Stice and Shaw (2004) indicated that the most promising programs were those that targeted established risk factors, such as the thin-ideal internalization, because these variables were precursors to the development of eating disorders.

An intervention program that has received initial support for its efficacy (e.g., Stice, Trost, & Chase, 2003) induced attitudinal (and ultimately behavioral) change by creating cognitive dissonance within the participants about their beliefs concerning sociocultural standards/ideals regarding being attractive and being a woman. Dissonance theory states that the possession of inconsistent cognitions/beliefs creates psychological discomfort, which motivates people to alter their cognitions or behaviors to restore consistency (Brehm & Cohen, 1962; Festinger, 1957). Based on this idea, individuals who act in ways contrary to previously held attitudes experience cognitive dissonance, which in turn leads them to alter their behaviors or attitudes to reduce the inconsistency

(Leippe & Eisenstadt, 1994). In initial randomized and nonrandomized trials designed to test the efficacy of a dissonance-based intervention, Stice et al. (2003) found that women who participated in the dissonance-based programs, which last three hours over three weeks, reported decreases, from baseline to termination, in their thin-ideal internalization, body dissatisfaction, dieting behaviors, negative affect, and bulimic symptoms relative to waitlist and placebo control groups; the majority of the changes remained at the 1-month follow-up.

In a more recent examination of the dissonance-based intervention, Stice, Shaw, Burton, and Wade (2006) randomly assigned 481 high school age girls to one of four conditions: (1) a dissonance-based eating disorder prevention program, (2) a healthy weight management prevention program, or (3) one of two different control conditions (i.e., expressive writing, or assessment-only). Over the three-week intervention, participants in the dissonance group showed significantly greater reductions in eating disorder risk factors and bulimic symptoms than the other three groups; the healthy weight participants showed similar reductions in risk factors and symptoms in comparison to the expressive writing and assessment-only control conditions. Although these effects faded over 6-month and 12-month follow-ups, dissonance and healthy weight participants showed significantly lower binge eating and obesity onset (as compared to the control and expressive writing participants) through 12-month follow-up, suggesting that both interventions have potential public health benefits.

Initial research has supported dissonance based models within adolescent and female college student population. However, more research is needed particularly with

college age women. The transition to college may be a particularly threatening time for some women and may exacerbate eating disordered behaviors. College is known to be a time of high stress, pressure to achieve academically and socially, and significant role and identity changes (Rosen, Jones, Ramirez, & Waxman, 1996). In fact, the college environment's emphasis on academic achievement, competition, and attractiveness might contribute to the development of disordered eating patterns within vulnerable students (Simon-Boyd & Bieschke, 2003). In addition, women living in dorms or participating in sororities might be also be at increased risk because of social contagion, where individuals take on the behaviors of the group to which they belong (Drewnowski et al., 1988; Edwards-Hewitt & Gray, 1993).

Although early prevention efforts produced few positive results (Pearson, Goldklang, & Striegel-Moore, 2002), recent studies have shown that specific types of interventions, such as cognitive dissonance based models, can reduce girls' and women's eating disorder risk (Stice, Shaw, Burton, & Wade, 2006). Even so, Stice et al. (2008) argued that more research was needed to evaluate the efficacy of intervention programs and offered suggestions for how programs could be improved. For example, programs might increase the number and duration of intervention sessions (Rooney & Murray, 1996; Stice & Shaw, 2004), attempt to increase accountability by making the in-session and home exercises more purposeful (e.g., writing out homework exercises in a workbook; Green et al., 2005), and investigate whether the dissonance and healthy weight interventions can be integrated to produce even stronger effects.

In light of these recommendations, and the fact that female undergraduates are a high-risk group for eating disorders and few studies have targeted them, the purpose of this study was to test three interventions – cognitive dissonance (CD), healthy weight (HW), and combined cognitive dissonance/healthy weight (CD/HW) – to determine their efficacy in reducing sociocultural risk factors and disordered eating behaviors among body-dissatisfied female undergraduates. In keeping with Stice et al.'s (2008) recommendations, these interventions were interactive, presented over six weeks (one hour per week), and provided the participants with the opportunity to practice the skills outside of the group session through targeted homework. In particular, this study was aimed towards determining if female college students who participated in the cognitive-dissonance and combined cognitive-dissonance intervention showed reductions in internalization of the thin ideal, body dissatisfaction, negative affect, dietary restraint, perception of social pressures to be thin, and bulimic symptomatology in comparison to the women who were in the wait-list and placebo (healthy-weight) control groups.

CHAPTER 2

METHOD

Participants

Participants were 77 female college students drawn from three large public universities located in the southern ($n = 57$), northern ($n = 6$), and eastern ($n = 14$) United States. Their average age was 21.2 years ($SD = 5.44$). Regarding year in school, 31.2% ($n = 24$) of the participants were first-year college students, 23.4% ($n = 18$) were sophomores, 23.4% ($n = 18$) were juniors, and 18.2% ($n = 14$) were seniors; 3.9% ($n = 3$) indicated they were in their 5th year or beyond. In terms of race/ethnicity, 66.2% ($n = 51$) identified as Caucasian/White, 18.2% ($n = 14$) identified as African American/Black, 6.5% ($n = 4$) identified as Hispanic/Latino/Mexican American, 5.2% ($n = 4$) identified as Asian American/Pacific Islander, and 2.6% ($n = 2$) identified as 'Other.' Sixty-six percent ($n = 51$) of the women had participated on a high school sport team, including dance (14%), volleyball (12%), and track and field (8%). Approximately 14% ($n = 11$) reported currently participating in sports at the recreational, club, or varsity level; the most commonly played sports were tennis (27%), ice skating (18%), and basketball (18%). In terms of when the women participated in the intervention, 28.6% ($n = 22$) did so in the fall 2006 semester, 7.8% ($n = 6$) in the spring 2007 semester, 35.1% ($n = 27$) in the fall 2007 semester, and 28.6% ($n = 22$) in the spring 2008 semester. The participants actual and ideal BMI were 23.46 kg/m² ($SD = 4.82$, range = 24.3) and 20.50 kg/m² ($SD = 2.35$, range = 15.4), respectively.

Instruments

Demographics

A brief demographic survey was used to gather the following information: age, race/ethnicity, previous athletic experience, weight, height, year in school, menstrual functioning/history, and if the participant has been or is currently receiving treatment for an eating disorder.

Thin-Ideal Internalization

The 19-item Beliefs About Attractiveness Scale-Revised (BAA-R; Petrie, Diehl, Rogers, & Johnson, 1996) assesses two aspects of societal values and idealizations concerning attractiveness: importance of being physically fit and in shape (9 items; Physically fit and in-shape women have a greater sense of well-being); and importance of being thin and attractive (10 items; A woman with an unattractive face will not go very far in life without a thin body). For each item, participants rate their agreement with each item using a 7-point Likert scale ranging from 1, *strongly disagree* to 7, *strongly agree*. Each factor total score is the average of those items; higher scores indicate more internalization of that belief.

In a sample of female undergraduates, Petrie et al. (1996) reported internal consistencies of .85 for the Importance of Being Physically Fit factor and .85 for the Importance of Attractive and Thin factor. Within the present study, Cronbach's alphas for Time 1 and Time 2 were .85 and .87 (Importance of Being Attractive and Thin) and .87 and .86 (Importance of Being Physically Fit and In Shape), respectively. They also

provided evidence for the construct validity of the BAA-R, reporting that the Attractive and Thin and Physically Fit factors, respectively, were significantly correlated with appearance orientation (Multidimensional Body-Self Relations Questionnaire - Appearance Orientation; $r = .25$ & $.26$), depression (CES-D; $r = .16$ & $.28$), concern with body shape (BSQ; $r = .42$ & $.44$), and bulimic symptoms (BULIT-R; $r = .40$ & $.46$). Further, the two factors were unrelated to a measure of social desirability and negatively related to self esteem (Rosenberg; $r = -.29$ & $r = -.32$).

The 14-item Sociocultural Attitudes towards Appearance Questionnaire (SATAQ; Heinberg, Thompson, & Stormer, 1995) assesses awareness of sociocultural pressures to be thin and attractive and internalization of those standards. For this study, only the 8-item internalization factor was used. For each item, individuals indicate their level of agreement on a 5-point Likert scale ranging from 1, *completely disagree*, to 5, *completely agree*. The total score is the average of the items and higher scores indicate greater internalization of general societal pressures and standards about attractiveness.

In a sample of female undergraduates, Heinberg et al. (1995) reported a Cronbach's alpha of .88; for the current study, Cronbach's alpha was .92 (Time 1) and .90 (Time 2). Regarding the scale's validity, Cashel, Cunningham, Landeros, Cokley, and Muhammad (2003) found that the scale correlated moderately (r 's ranging from .45 to .61) with the subscales of the Eating Disorder Inventory (EDI; Garner, 1991). Griffiths et al. (1999) found that groups designated as anorexic, bulimic, and eating disordered not other specified scored significantly differently from one another.

Sociocultural pressures. The 8-item Perceived Sociocultural Pressure Scale (PSPS) measures the degree to which individuals experience external pressure to be thin. Individuals respond on a 5-point Likert scale ranging from 1, *no pressure*, to 3, *some pressure*, to 5, *a lot of pressure*. Total scores are the average of the 8 items; higher scores indicate greater levels of perceived pressure to be thin (Stice et al., 1996).

Using a sample of female undergraduates, Stice et al. (1996) reported 2-week test-retest reliability to be .93, and internal consistency to be .87. Within the current study, Cronbach's alpha was .86 (Time 1) and .78 (Time 2). Further, based on retrospective reports of parental pressure to be thin, the PSPS was found to have good construct validity (Stice et al., 1996).

Body Image Concerns

The 11-item Body Parts Satisfaction Scale-Revised (BPSS-R; Petrie, Tripp, & Harvey, 2002) measures – Satisfaction with Body (7 items) and Satisfaction with Face (4 items) – by focusing on specific body parts that are typically associated with dissatisfaction in females. For each item, individuals rate their level of satisfaction using a 6-point Likert scale, ranging from 1, *extremely dissatisfied*, to 6, *extremely satisfied*. Total scores for each dimension are the average of those items; higher scores indicate greater satisfaction with body or face. In this study, only the Satisfaction with Body factor was utilized.

Within a sample of female undergraduate and graduate students, Petrie et al. (2002) reported Cronbach's alphas of .90 (Body) and .72 (Face). They also reported

significant correlations between the Face and Body factors, respectively, and the Multidimensional Body Self-Relations Questionnaire Appearance Evaluation subscale (r 's = .44 & .75), the Situational Inventory of Body Image Dysphoria (r 's = -.46 & -.73), and the Body Shape Questionnaire (r 's = -.39 & -.75), providing evidence for their validity. In the present study, Cronbach's alphas were .90 (Body) at Time 1, and .91 (Body) at Time 2.

The 10-item Body Shape Questionnaire-Revised (BSQ-10-R; Mazzeo, 1999) assesses the extent to which one is preoccupied with the size and shape of one's body. Items are scored on a 6-point Likert scale, ranging from 1, *never*, to 6, *always*. The total scores range from 1 to 6, and higher scores indicate increased preoccupation (Mazzeo, 1999).

Within a sample of female undergraduates, Mazzeo (1999) reported high internal consistency (Cronbach's alpha = .96). Cronbach's alpha in the current study was .97 (Time 1) and .96 (Time 2). The BSQ-10-R was significantly correlated with the EAT (.74) and the BULIT-R (.77). In addition, the correlation between the original BSQ and the BSQ-10-R was .99 (Mazzeo, 1999), suggesting that the shortened version provided a comparable measure of body shape concern.

Negative Affect

The sadness, stress, anxiety, and guilt/shame subscale items from the Positive Affect and Negative Affect Scale-Revised (PANAS-X; Watson & Clark, 1992) were used to measure participants' emotional state. For each item, participants reported the extent

to which they felt these emotional states over the past month using a 5-point scale ranging from 1, *very slightly or not at all*, to 5, *extremely*. Each subscale total score was the average of the items; higher scores represented higher levels of that negative affective state.

Using a sample of undergraduate students, Watson & Clark (1992) reported Cronbach's alphas of .91 to .95 and 2-month test-retest reliabilities that ranged from .71 to .85 for these subscales. Furthermore, self-reported negative affect on the PANAS-X showed acceptable agreement with peer reports (Watson & Clark, 1992). However, in this study, positive and negative affect scores were not calculated. Rather, four individual items from the negative affect scale were used to assess levels of depression/sadness, anxiety, stress, and guilt/shame. The internal consistency scores of the four individual items from Time 1 to Time 2 were .68 (depression/sadness), .62 (anxiety), .68 (stress), and .61 (guilt/shame).

Disordered Eating

The 36-item Bulimia Test-Revised (BULIT-R; Thelen, Mintz, & Vander Wal, 1996) assesses the symptoms of bulimia nervosa as defined in the DSM-IV (APA, 1994). For each of the 28 items that contribute to the total score, individuals respond on a 5-point scale ranging from 1, *absence of a disturbance*, to 5, *extreme disturbance*. Total score ranges from 28 to 140; higher scores indicate greater endorsement of bulimic attitudes and behavior.

Using a sample of females, both controls and individuals diagnosed with bulimia, Thelen et al. (1996) reported a Cronbach's alpha of .98. In the current study, Cronbach's alpha was .61 (Time 1) and .89 (Time 2). Concerning validity, McCarthy, Simmons, Smith, Tomlinson, and Hill (2002) reported significant correlations between the BULIT-R scores and self-monitoring measures of bulimic symptoms. The BULIT-R also yielded a positive predictive value of .81, a negative predictive value of .98, a specificity of .97, and a sensitivity of .91 (Thelen et al., 1996).

The 10-item Dutch Restrained Eating Scale (DRES; van Strien, Frijters, Van Staveren, Defares, & Deurenberg, 1986) assesses dieting behaviors. On each item, using a 5-point Likert scale that ranges from 1, *never*, to 5, *always*, participants indicate the frequency in which they have used that dieting behavior during the last month. The total score is the average of the 10 items; higher scores indicate more restrained eating.

Within a sample of women aged 31 to 34 years, Van Strien et al. (1986) reported a Cronbach's alpha of .95, a 3-month test-retest reliability of .82, and a negative correlation with self-reported caloric intake (Laessle, Tuschl, Kotthas, Prike, 1989; Stice, 1998). Within the current study, Cronbach's alpha was .94 (Time 1) and .93 (Time 2).

Nutritional Knowledge

A 15-item nutrition quiz (NUT-Q) was developed by the author to assess participants' knowledge of basic nutrition and physical activity. For each item, participants indicated whether or not they believed the statement to be true or false. The

total score was the number of correct responses, and ranged from 0 to 15; higher scores indicated greater knowledge about general principles of nutrition.

Procedure

After receiving approval from the institutional review boards at three universities, participants were recruited during the fall 2006, spring 2007, fall 2007 and spring 2008 semesters to participate in a study for female college students who were experiencing body image concerns. The participants were notified of the study through in-class announcements, advertisements in university newspapers, the psychology department's Web-based recruitment system, and flyers distributed to various buildings throughout the campuses (e.g., campus recreational centers, building bulletin boards, etc.). These advertisements requested that potential participants notify the primary investigator of their interest in the programs and that they would then be contacted to schedule their participation.

After the participants notified the researcher of their interest and confirmed their ability and intent to attend at all six intervention sessions, they were assigned to one of four conditions: cognitive-dissonance (CD), combined dissonance/healthy weight (CD/HW), healthy weight (HW), or wait-list control (CON). In one of the semesters, the participants were randomly assigned to condition, and in the other three semesters, the participants were assigned to groups based on their availability and the meeting time they could attend. Within each meeting time, control group members were randomly selected from the women who had signed up to attend/participate at that time. In two of the

university locations, the north and east coast, there were not enough participants to fill all three intervention groups during the semester. Thus, groups to run were chosen based on current total intervention group participant numbers in order to have equal group membership at the conclusion of the study.

During the fall 2007 semester, one group was terminated prior to the sixth meeting time because of member attrition. Overall, there were 20 participants that did not complete the 6-week intervention or follow through to take the measures when the groups were completed: five were from the control group (25.2%), 9 were from the cognitive-dissonance group (45.1%), 1 was from the healthy weight group (4.5%), and 5 were from the combined intervention (25.2%). In addition, there were three females who had been previously diagnosed or recently treated for an eating disorder and were excluded from the study because they already had received treatment for their disorders, whereas everyone else in the study had not and were just body-dissatisfied.

Within this study, all group facilitators were advanced psychology doctoral students. Throughout the study, they were supervised by a licensed psychologist and met weekly to discuss past meetings and plan for the upcoming group sessions. In addition, the facilitators taped their sessions and these were reviewed by the supervisor and sent to the primary investigator for review. Taping was done to ensure that the facilitators were adequately following the standardized intervention lessons; no problems were noted in the delivery of the intervention materials. Further, group facilitators practiced group content under the supervision of the licensed psychologist to receive feedback on their performances and prepare for working live with the women in the study. In all, there

were 8 different group facilitators, including 7 facilitators at the southern university, and 1 facilitator (the same individual) at the northern and east coast universities.

Overall, there were approximately 3 to 7 participants per group. Participants gave voluntary written informed consent and were either entered into a drawing to receive one of 4 \$25 cash prizes at each site, or were given \$10 Starbucks gift cards following full participation in the study. Participants at the Southern University also had the opportunity to earn extra credit for classes for their participation. Full participation in this study included filling out a questionnaire packet comprised of a demographic section, a nutrition knowledge quiz, and the BPSS-R, BSQ, BAA-R, BULIT-R, PSPS, SATAQ, PANAS-X, and DRES prior to and following the program.

All three interventions (CD, HW, and Combined) consisted of weekly 1-hour meetings that occurred six consecutive weeks during the fall and spring semesters. The first and last sessions took approximately 90 minutes because questionnaires were completed prior to the beginning of Session 1 and immediately following completion of Session 6; Sessions 2 through 5 were 60 minutes each. During the spring 2008 semester, an unexpected weather event impacted a planned group meeting time, and the last session had to condense the material from the 5th meeting time (which was cancelled) and 6th session. Otherwise, all groups met for all six planned sessions. Overall, there were 17 participants in the control group, 20 participants in the CD group, 19 participants in the HW group, and 21 participants in the combined group. Among the three intervention groups, all members attended at least five out of the six sessions otherwise their data were excluded.

Intervention Overviews

Please contact primary author for complete intervention protocols and corresponding program workbooks.

Cognitive-Dissonance

Session 1. In this session, the facilitator provided an overview and introduced participants to the rules and expectations of the group. The initial session was largely interactive with discussions regarding the definition and origin of the thin ideal. The participants also engaged in partner and group discussions of their own and others' body attitudes. The importance of attendance and completing homework assignments was stressed. The homework for the next week encouraged participants to stand in front of a mirror and write down 10 to 15 qualities (including physical, emotional, intellectual, athletic, or social qualities) that come to mind as they look at their image. They also were encouraged to increase their awareness of and pay more attention to their surroundings and the types of comments and ideas they hear related to the way we look.

Session 2. Session two re-acquainted group members and allowed participants to provide feedback and engage in discussion about the mirror exercise from the previous week. The members also explored different sources in their environments that send messages regarding body ideals, what the messages consist of, and how these messages influenced their beliefs and feelings towards their own bodies. Assigned homework included bringing in one media source that portrays a message that females need to be attractive, beautiful, or have to meet a certain standard regarding body size and shape.

They also were assigned to write down how they feel about themselves and how these feelings are linked to the way they feel about or view their body.

Session 3. Session three allowed each participant to share examples she has seen in the media regarding body shape ideals and how these images impact the way they think and feel about their own bodies. Participants had the opportunity to become more aware of their body distortions as they made self and partner drawings during session. The participants were assigned to pay attention to the messages in their environment and also note how they felt, and practice making a counter statement to refute the message that is being communicated. The participants' second assignment encouraged them to write about what they have learned regarding how society influences their beliefs and feelings about their own bodies.

Session 4. At the beginning of Session 4, participants shared reactions to the homework assignments from the previous week. The members had the opportunity to work with each other in developing counter-attitudinal statements resisting body ideals, and develop a 'Top 5' list consisting of the best statements they can use to refute the thin ideal. Homework encouraged participants to practice making counter-statements whenever they begin thinking or feeling negatively about their body size or shape. When this type of thinking occurred, they were assigned to record what type of situation they were in, what they were thinking about, how they were feeling, and how they attempted to refute the message being received.

Session 5. This session allowed participants to share their experiences from the previous week when attempting to refute the thin ideal. Members also shared the costs of

pursuing the thin ideal, on a societal and individual level. The participants' shared their own positive body qualities out loud with the group as they each looked in the mirror during the group session. The group also worked collaboratively on making a 'Top 10' list for things girls/women can do to resist the thin ideal. Homework included picking one of the items from the group Top 10 list and doing this behavior over the next week. Before the next meeting, participants were encouraged to write down the behavior they had chosen and how the experience of actually following through on their behavior went for them. The participants were also asked to write a 1-page essay discussing their own personal pressures and costs associated with pursuing the thin-ideal.

Session 6. In the final session, participants shared their experiences of attempting their own "body activism." The members read their essays written the previous week and had an opportunity to discuss personal reactions both during the active reading during session and as they were being written. The connection between resisting the thin ideal and feeling more positive about their own bodies was discussed, and participants re-committed to body activism and discussed how they may overcome obstacles without the group support. The exit homework consisted of doing one behavioral "experiment" related to each participants own body image concerns and engaging in one act of body activism. Participants were encouraged to e-mail the facilitator to let them know how the experience went for them.

Healthy Weight Intervention

Session 1. In this session, the facilitator provided an overview and introduced

participants to the rules and expectations of the group. This initial session was interactive as well as educational, providing discussion and information regarding what it means to be healthy, how our bodies work with respect to healthy eating and achieving a healthy weight, the impact of exercise and energy needs, and a healthy approach to making food choices. For homework, the participants were introduced to the USDA food pyramid Website and assigned to practice logging on and recording food intake and physical activity. The participants also were asked to bring in a list of 3 to 5 questions about eating, food, or diets.

Session 2. Session two allowed participants to identify and share beliefs they have regarding food, eating, diet, or exercise. During the session, the participants learned the truth about different nutrition myths and were provided with the opportunity to learn more about potential beliefs they hold regarding nutrition and eating. The food groups also were introduced, with emphasis placed on making healthy choices within each food group and how each group contributes to the functioning of the body and overall health. Participants were assigned to keep a food record for at least 3 weekdays and 1 weekend day for the following week, and bring in a print out of various analyses that were easily performed on the USDA Website (which was clearly explained in the participants' workbook). The participants also were encouraged to bring in one label from a food that they eat on a daily basis.

Session 3. In Session 3, participants discussed the previous week of monitoring and were provided feedback regarding their printouts from the My Pyramid program. Approaches to healthy eating were explored and nutrition label information was taught

and analyzed. Participants also discussed obstacles that prevented them from making healthy nutrition choices. The homework assignments encouraged participants to record two barriers identified in the group Top 10 list and attempt to overcome these barriers over the next week. The participants also were asked to continue to track food intake and began to monitor and record their exercise as well (same format as food intake- 3 weekdays and 1 weekend day).

Session 4. Session four allowed participants to reflect and ask questions about their food logs and identified obstacles from the previous week. The participants also examined two different diets and provided feedback on the positives and negatives of each food plan. An interactive discussion also covered ideas regarding health and benefits of exercise as well as the idea of over-exercising and the impact too much exercise can have on the body. The participants were assigned to set an exercise goal for the next week and continue tracking nutrition and physical activity levels. The participants also were encouraged to make a list of 3 obstacles that make it more difficult for them to maintain a healthy exercise routine.

Session 5. In Session 5, the participants discussed their previous week of exercise monitoring and how they attempted to overcome their identified obstacles. Information regarding stress and coping was shared and allowed group members to explore how stress impacts their lives. The consequences of too much exercise also were shared, with participants examining the warning signals if they are engaging in too much physical activity. Participants' also had the opportunity to examine the exercise routines of four different females and determine if and what adjustments would be beneficial. For

homework, the participants were encouraged to continue to enter their nutrition and physical activity information into the My Pyramid tracker.

Session 6. In the final session, participants had the opportunity to share their monitoring and any questions they may have had from the previous week. The members discussed how their nutrition or physical activity levels may change over the year and implications this may have for their health. The group also worked collaboratively to develop a ‘Top 5’ list of things that will help them maintain a healthy lifestyle in college and beyond, and were asked to commit to these changes. For exit homework, the participants were asked to select and record 1 to 2 of the behaviors from the group Top 5 list and make a commitment to follow through.

Combined Dissonance/Healthy Weight Intervention

Session 1. In Session 1, the facilitator provided an overview of the group and forthcoming sessions as well as introduced participants to the rules and expectations of the group. The initial session was largely interactive with discussion of the definition and origin of the thin ideal, increasing awareness to our own and others body attitudes, and exploring messages from the media, family, and friends regarding body size and shape. The importance of attendance and completing the homework exercises was also stressed. Homework for the first week encouraged the participants to think about 3 to 5 questions about eating, food, or diets to discuss for the next meeting. The participants also were asked to pay attention to the media and observe messages being communicated over the next two weeks. After observing the media for approximately two weeks, the

participants were encouraged to bring in one media source for the third meeting depicting a message that females need to be attractive, beautiful, or have to meet a certain standard regarding body size and shape

Session 2. Session two allowed participants to identify and share beliefs they had regarding food, eating, diet, or exercise. During the session, the participants learned the truth about different nutrition myths and were provided with the opportunity to learn more about potential beliefs they hold regarding nutrition and eating. The idea of set point weight and maintaining an energy balance was introduced. The food groups also were discussed, with an emphasis placed on top choices within each food group and how each group contributes to the functioning of the body and overall health. For homework, the participants were asked to keep a food record on the USDA food pyramid Website for at least 3 weekdays and 1 weekend day and print out the corresponding analyses at the end of the week. They also were reminded to bring in one media source for the following week.

Session 3. Session three allowed each participant to share examples they had seen in the media regarding body shape ideal, and how these images impact the way they think and feel about their own bodies. Participants had the opportunity to become more aware of their body distortions as they made self and partner drawing during session. The participants were encouraged to continue paying attention to the messages in their environment, but also were asked to note how they felt and make a counter statement to refute the message that was being communicated. They were asked to note and bring in at least 3 examples for the next meeting. The participants also were encouraged to bring

in one food label to examine during the next session, and to record food intake as well as physical activity levels on the USDA Website.

Session 4. At the beginning of Session 4, participants shared reactions to the homework assignments from the previous week. Approaches to healthy eating were discussed and nutrition label information was taught and analyzed. Participants also discussed obstacles that prevent them from making healthy nutrition choices, and had an interactive discussion covering ideas regarding health and the benefits of exercise. The participants were assigned to record two obstacles identified in the group Top 10 list and try to overcome them throughout the next week. Participants also were asked to make a list of three obstacles (e.g., physical, mental, etc.) that make it more difficult to maintain a healthy exercise routine and continue monitoring food and physical activity levels. For the next meeting, the participants also were encouraged to stand in front of a mirror and look at themselves. At that time, they were told to think about and record 10 to 15 qualities they possess, including physical, emotional, intellectual, athletic, or social characteristics.

Session 5. Session five allowed participants to reflect and ask questions about their food logs and identified obstacles from the previous week. Members also shared the costs of pursuing the thin ideal on both societal and individual levels. The participants shared their own positive body qualities out loud with the group as they each look in a mirror during the group session. The group also worked collaboratively on making a ‘Top 10’ list for things girls/women can do to resist the thin ideal. Homework encouraged participants to pick one of the items on the group Top 10 list and attempt to

do this behavior over the next week. At that time, they were encouraged to record their reaction to doing this behavior. The participants also were asked to continue monitoring and recording their food intake and physical activity levels.

Session 6. In the final session, participants shared their experiences of attempting their own “body activism.” The connection between resisting the thin ideal and feeling more positively about their own bodies was discussed, and participants re-committed to body activism and discussed how they may overcome obstacles without the group support. Information regarding stress and coping were shared and allowed group members to explore how stress impacts their lives. The group also worked collaboratively to develop a ‘Top 5’ list of things that would help them maintain a healthy lifestyle in college and beyond, and were asked to commit to these changes. For homework, the participants were asked to record 1 to 2 of the behaviors identified on the Top 5 list and make a commitment to follow through on them. They also were asked to challenge themselves to do something they do not normally do because of body image concerns, such as wearing shorts to school, going to the pool in a swimsuit, etc. over the next week and encouraged to e-mail their facilitator to let them know how it turned out.

Design and Analysis

This research study followed a quasi-experimental design. Although one of semesters allowed random assignment, the participants within the other semesters self-assigned to condition by selecting a meeting time they could attend (when selecting the time, they did not know which group would be run that day). When participants picked a

meeting time to attend, control group members were randomly selected from these groups.

Initially, statistical assumptions, such as skewness and kurtosis were examined and descriptive statistics were performed. To examine the effectiveness of the intervention, MANCOVA procedures were used; Time 1 scores were used as the covariate and Time 2 scores as the dependent variables. The dependent variables included thin-internalization, perceived sociocultural attitudes towards appearance, perceived pressures, satisfaction with body, negative affect, disordered eating, and dieting behaviors, and the independent variables of group membership included CD-combined (CD and CD/HW) and control groups (HW and wait-list control). In addition, ANCOVA procedures and dependent sample t-tests were performed to examine potential changes across time for each group if the MANCOVA analysis was significant. Alpha was set at .05 for all analyses, and for each analysis, strength of association was presented through partial η^2 or Cohen's d values.

CHAPTER 3

RESULTS

There were 20 participants who did not complete the study, and thus did not respond to questionnaires at Time 2 (5 were from the control condition, 9 from the cognitive-dissonance condition, 1 from the healthy weight condition, and 5 from the combined condition). To determine if there was any systematic bias in who dropped out of the study, these “noncompleters” were compared to the women who stayed in the study throughout (i.e., the “completers”) on the Time 1 measures. Overall, the completers did not differ significantly from the noncompleters on bulimic symptoms, $F(3, 94) = 0.84, p = .394$, partial $\eta^2 = .008$, dietary restraint, $F(3, 94) = 1.80, p = .255$, partial $\eta^2 = .014$, beliefs regarding the importance of being physically fit and in shape, $F(3, 94) = 0.09, p = .664$, partial $\eta^2 = .002$, beliefs regarding the importance of being thin and attractive, $F(3, 94) = 1.78, p = .589$, partial $\eta^2 = .003$, internalization of sociocultural attitudes towards appearance, $F(3, 94) = 1.85, p = .658$, partial $\eta^2 = .003$, perceived pressures to be thin, $F(3, 94) = 0.22, p = .177$, partial $\eta^2 = .026$, satisfaction of body, $F(3, 94) = 3.42, p = .519$, partial $\eta^2 = .004$, general body satisfaction and/or preoccupation, $F(3, 94) = 2.09, p = .974$, partial $\eta^2 = .000$, and levels of depression/sadness, $F(3, 94) = 0.18, p = .730$, partial $\eta^2 = .001$, anxiety, $F(3, 94) = 1.52, p = .927$, partial $\eta^2 = .001$, stress, $F(3, 94) = 0.49, p = .847$, partial $\eta^2 = .001$, or guilt/shame, $F(3, 94) = 0.04, p = .395$, partial $\eta^2 = .001$. In addition, the “completers” did not differ significantly from the “noncompleters” in regard to age, $F(1, 94) = 1.29, p = .259$, partial $\eta^2 = .014$, actual BMI,

$F(1, 94) = 0.46, p = .498$, partial $\eta^2 = .005$, and ideal BMI, $F(1, 94) = 1.30, p = .258$, partial $\eta^2 = .014$. Thus, those participants who dropped out of the study may have done so due to scheduling/commitment difficulties or other miscellaneous reasons rather than because they were more distressed in terms of their disordered eating attitudes and/or behaviors at the beginning of the study.

For those who completed the study, a correlation matrix containing the means, standard deviations, skewness, kurtosis, and alpha coefficients of all the Time 1 and Time 2 measured variables is presented in Table 1.

Intervention Analyses

Due to the relatively small sample sizes associated with all four groups in this study, I made the decision to combine the four groups into two: (1) an intervention group comprising the cognitive-dissonance and cognitive-dissonance/healthy-weight groups, and (2) a control group comprising the healthy weight (placebo) and assessment-only groups. I took this step for several reasons. First, the dissonance groups were the most similar conceptually in that each one received the active components of the intervention program (i.e., the elements that were supposed to lead to the creation of cognitive-dissonance). Second, the dissonance groups did not differ significantly from one another on their Time 1 scores, nor did they differ at Time 2 (all p 's $> .05$), with the exception of their scores on the food and nutrition knowledge test, which was higher for the participants in the combined program at Time 2. Third, the healthy weight and assessment-only control group did not differ significantly from one another on their Time

1 scores, nor did they differ at Time 2 (all p 's > .05), with the exception of two items assessing negative affect (control group members reported fewer symptoms of depression/sadness and stress than members in the healthy weight placebo control). In addition, the healthy weight group had higher food/nutrition knowledge than the members in the control group. The fact that the combined and healthy weight group had higher food/nutrition knowledge than the CD and the control groups, respectively, is not surprising because they received information during the group that specifically related to this measure whereas the other two groups did not. Fourth, although I recognized that I lost some specificity in my comparisons, by combining the groups, I increased the power of the statistical tests and my ability to detect significant (and meaningful) between group differences. This approach allowed me to determine the extent to which an intervention was more helpful to these college women than a control condition.

The two groups in this study -- CD-combined ($n = 36$) and control ($n = 41$), were similar to one another on current age, $F(1, 75) = .097, p = .757$, partial $\eta^2 = .01$, actual body mass index, $F(1, 75) = 0.99, p = .321$, partial $\eta^2 = .013$, ideal body mass index, $F(1, 74) = 2.39, p = .126$, partial $\eta^2 = .031$, previous sport participation, $\chi^2(1, N = 76) = .033, p = .856$, current sport participation, $\chi^2(1, N = 76) = 1.60, p = .206$, and age of first period, $F(1, 74) = 0.59, p = .444$, partial $\eta^2 = .008$. These findings indicate that the two groups were similar to one another on basic demographic data and suggest that the assignment to groups was relatively equal. See Table 2 for the means and standard deviations of all continuous variables.

The two groups were compared on their Time 1 measured variable scores to determine their similarity at the beginning of the study. The groups scored similarly to one another on all the variables, including bulimic symptomatology, $F(1, 75) = 0.53, p = .819$, partial $\eta^2 = .001$, dietary restraint, $F(1, 75) = 0.73, p = .395$, partial $\eta^2 = .010$, the importance of being physically fit and in shape, $F(1, 75) = 1.60, p = .210$, partial $\eta^2 = .021$, the importance of being thin and attractive, $F(1, 75) = 0.75, p = .387$, partial $\eta^2 = .010$, internalization of general sociocultural attitudes towards appearance, $F(1, 58) = 2.68, p = .107$, partial $\eta^2 = .044$, perceived sociocultural pressures to be thin, $F(1, 58) = 2.57, p = .114$, partial $\eta^2 = .042$, satisfaction with body, $F(1, 75) = 0.18, p = .677$, partial $\eta^2 = .002$, preoccupation with body size and shape, $F(1, 58) = 0.72, p = .400$, partial $\eta^2 = .012$, levels of depression/sadness, $F(1, 75) = 0.89, p = .349$, partial $\eta^2 = .012$, anxiety, $F(1, 75) = 1.39, p = .243$, partial $\eta^2 = .018$, stress, $F(1, 75) = 0.15, p = .700$, partial $\eta^2 = .002$, shame/guilt, $F(1, 75) = 0.04, p = .839$, partial $\eta^2 = .001$, and food and nutrition knowledge, $F(1, 58) = 0.33, p = .566$, partial $\eta^2 = .006$. Again, this finding suggests that group assignment created relatively equivalent groups at the beginning of the study. See Table 3 for all means and standard deviations of all variables.

Multivariate analyses of covariance (MANCOVAs) were used to compare the groups (Intervention vs. Control) at Time 2, using Time 1 scores as the covariate. This approach is preferred over repeated measure analyses because it “...enhances the power of the analyses of treatment effects by reducing the error term used in the analysis (p. 21).” (Russell, Kahn, Spoth, & Altmaier, 1998). Thus, each variable was tested independently using this approach. When significant, ANCOVAs were used to determine

the specific differences. In addition, dependent sample *t*-tests were used to examine within group changes over the course of the study. See Tables 4 and 5 for ANCOVA and *t*-test analyses of all variables.

Pressures and Internalization

The MANCOVA for pressures and internalization as measured by the Time 1 PSPS, SATAQ, BAAR-fit, and BAAR-thin was significant, Wilks' Lambda = .724, $F(4, 51) = 4.85, p < .005$, partial $\eta^2 = .276$. This finding suggests that, after controlling for the women's scores at Time 1, the intervention group reported fewer pressures and less internalization than the control group.

The ANCOVA for perceived pressures as measured by the Time 2 PSPS was significant, $F(1, 54) = 6.75, p < .05$, partial $\eta^2 = .111$, as was the covariate (Time 1 PSPS), $F(1, 54) = 55.15, p < .0001$, partial $\eta^2 = .51$. This finding indicates that even after controlling for the participants' Time 1 scores, the intervention group ($M = 2.10, SE = 0.08$) reported perceiving fewer societal pressures regarding the need to be thin and attractive than did the women in the control group ($M = 2.46, SE = 0.09$). However, surprisingly, over the course of the study, the CD-combined group did not report a significant decrease in perceived sociocultural pressures to be thin (Time 1: $M = 2.17, SD = 0.92$; Time 2: $M = 2.03, SD = 0.78$), $t(32) = 1.09, p = .285$, Cohen's $d = -0.15$. As expected, there were no significant changes over time in the control group's scores.

The ANCOVA for the general internalization of sociocultural pressures as measured by Time 2 SATAQ was significant, $F(1, 54) = 14.47, p < .0001$, partial $\eta^2 =$

.211, as was the covariate (Time 1 SATAQ), $F(1, 54) = 16.5, p < .0001$, partial $\eta^2 = .400$. Thus, even after controlling for the participants' Time 1 scores, the intervention group ($M = 2.71, SE = 0.12$) reported less general internalization of societal beliefs about attractiveness than did the women in the control group ($M = 3.43, SE = 0.14$). Further, for participants within the intervention group, SATAQ scores decreased significantly over the course of the study, from Time 1 ($M = 3.08, SD = 1.06$) to Time 2 ($M = 2.58, SD = 0.86$), $t(32) = 2.57, p < .05$, Cohen's $d = -0.47$, indicating that the intervention was effective in decreasing how much these women internalized society's general values about beauty and attractiveness. As expected, the control group did not experience significant changes over time regarding their internalization of societal pressures.

The ANCOVA regarding women's beliefs about being physically fit and in shape as a necessary and essential part of being considered attractive as a woman (Time 2 BAAR-Fit) was not significant, $F(1, 54) = 2.12, p > .05$, partial $\eta^2 = .038$, although the covariate was (Time 1 BAAR-Fit), $F(1, 54) = 18.9, p < .0001$, partial $\eta^2 = .260$. Thus, after controlling for participants' Time 1 scores, the intervention group ($M = 4.17, SE = .18$) did not endorse significantly fewer beliefs regarding the importance of being physically fit and in shape than did the control group ($M = 4.58, SE = .20$). However, over the course of the study, the women in the dissonance-based group reported significant decreases on this measure of internalization (Time 1: $M = 4.60, SD = 1.22$; Time 2: $M = 4.01, SD = 1.24$), $t(40) = 3.11, p < .05$, Cohen's $d = -0.48$, suggesting that the intervention was effective at reducing participants' idealization regarding the importance of having a physically fit and in shape body size and shape. In addition, the

control group also experienced such significant changes on this variable over time (Time 1: $M = 4.93$, $SD = 1.04$; Time 2: $M = 4.65$, $SD = 1.07$), $t(35) = 2.18$, $p < .05$, Cohen's $d = -0.26$.

The ANCOVA regarding women's beliefs about being thin as a necessary and important part of being considered attractive as a woman (Time 2 BAAR-Thin) was significant, $F(1, 54) = 5.57$, $p < .05$, partial $\eta^2 = .094$, as was the covariate (Time 1 BAAR-thin), $F(1, 54) = 13.51$, $p = .001$, partial $\eta^2 = .20$. Thus, even after controlling for the participants' Time 1 scores, the intervention group ($M = 2.14$, $SE = 0.14$) endorsed fewer beliefs regarding the importance of being thin and attractive than did the control group ($M = 2.65$, $SE = 0.15$). Further, over the course of the study, the women in the intervention group reported decreases in this type of internalization (Time 1: $M = 2.72$, $SD = 1.02$; Time 2: $M = 2.14$, $SD = 0.97$), $t(40) = 4.25$, $p < .05$, Cohen's $d = -0.57$, indicating that the intervention was effective at reducing how much participants' subscribed to beliefs about having a thin and attractive body. As expected, the control group did not experience significant changes over time.

Body Dissatisfaction

The MANCOVA for body dissatisfaction as measured by the Time 1 BSQ and BPSS was significant, Wilks' Lambda = .823, $F(2, 55) = 5.93$, $p < .005$, partial $\eta^2 = .177$. This finding suggests that, after controlling for the women's scores at Time 1, the participants in the intervention group reported greater body satisfaction and less body preoccupation than the participants in the control group.

The ANCOVA for body preoccupation as measured by Time 2 BSQ was significant, $F(1, 56) = 8.16, p < .01$, partial $\eta^2 = .127$, as was the covariate (Time 1 BSQ), $F(1, 56) = 11.9, p < .001$, partial $\eta^2 = .18$. Thus, even after controlling for the participants' Time 1 scores, the intervention group ($M = 2.68, SE = 0.16$) was less preoccupied with their bodies size and shape after the intervention than the Control group ($M = 3.40, SE = 0.18$). In addition, the intervention group's body preoccupation significantly decreased from Time 1 ($M = 3.25, SD = 1.35$) to Time 2 ($M = 2.65, SD = 1.12$), $t(33) = 2.59, p < .05$, Cohen's $d = -0.44$, indicating that these women improved as a result of the intervention. As expected, the control group did not experience significant changes in body preoccupation over time.

The ANCOVA for body satisfaction as measured by Time 2 BPSS was significant, $F(1, 56) = 7.98, p < .01$, partial $\eta^2 = .125$, as was the covariate (Time 1 BPSS-body), $F(1, 56) = 52.76, p < .0001$, partial $\eta^2 = .49$. Thus, even after controlling for the participants' Time 1 scores, the intervention group ($M = 3.62, SE = .11$) felt more positively about their bodies after the treatment than did the control group ($M = 3.04, SE = 0.12$). Further, when looking just at the intervention group across time, body satisfaction scores improved significantly from Time 1 ($M = 3.29, SD = 1.21$) to Time 2 ($M = 3.63, SD = 1.11$), $t(40) = -2.66, p < .05$, Cohen's $d = 0.28$, suggesting that these women experienced significant improvements in the way they think and feel about their bodies as a result of participating in the intervention. As expected, the control group did not experience any significant changes across the course of the study.

Negative Affect

The MANCOVA for negative affect as measured by the four Time 2 PANAS-X items (depressed/sad, anxious, stressed, shameful/guilty) was not significant, Wilks' Lambda = .955, $F(4, 68) = 0.81$, $p > .05$, partial $\eta^2 = .05$. This finding suggests that, after controlling for the women's scores at Time 1, the participants in the intervention group did not report fewer symptoms of negative affect in comparison to the participants in the control group at the conclusion of the program. In addition, on each of the four negative affect variables, there were no significant changes over the course of the study.

Disordered Eating

The MANCOVA for disordered eating as measured by the Time 1 DRES and BULIT-R was not significant, Wilks' Lambda = .986, $F(2, 72) = 0.51$, $p = 0.60$, partial $\eta^2 = .014$. This finding suggests that, after controlling for the Time 1 scores, the two groups did not differ significantly from each other on their Time 2 dietary intent and bulimic symptomatology. However, when the intervention group was examined across the course of the study, these women reported significant decreases in their dietary intent from Time 1 ($M = 2.71$, $SD = 1.14$) to Time 2 ($M = 2.42$, $SD = 0.98$), $t(40) = 2.14$, $p < .05$, Cohen's $d = -0.25$, and significant changes in level of bulimic symptomatology over the course of the study (Time 1: $M = 88.6$, $SD = 9.56$; Time 2: $M = 56.5$, $SD = 18.6$), $t(40) = 8.08$, $p < .0001$, Cohen's $d = -2.29$. Further, although the control group did not experience any significant changes in dietary intent over the course of the study, there were significant reductions in bulimic symptomatology within these participants from Time 1 ($M = 89.1$,

$SD = 11.5$) to Time 2 ($M = 60.2$, $SD = 18.9$), $t(35) = 6.27$, $p < .0001$, Cohen's $d = -1.93$, contributing to non-significant findings when the two groups were compared at the conclusion of the programs.

CHAPTER 4

DISCUSSION

The purpose of this study was to investigate the effectiveness of a cognitive-dissonance based intervention that created dissonance through discussion, exercises, and homework aimed at addressing and countering internalized sociocultural pressures, beliefs and values about women's bodies, attractiveness and worth in the U.S. Consistent with theory (Festinger, 1957), participants created dissonance by actively identifying, discussing, and then challenging the societal beliefs about attractiveness that they had internalized and allowed to influence (often negatively) their feelings, self-perceptions, and behaviors. Through the dissonance they experienced, they put themselves in the position to change their attitudes about what it means to be a worthwhile person and an attractive woman in society, and to reject society's message that beauty is defined in one particular way and that those who do not measure up, are somehow less than.

Theoretically, such changes in attitudes about beauty, body, and self would lead to higher levels of satisfaction with body size and shape, more positive emotions, less focus on dieting and restricting food intake, and fewer symptoms of disordered eating (e.g., bulimic symptoms). As healthier and less stringent thoughts about body size and shape, appearance, and attractiveness are adopted, participants may begin to act in accordance with these and adopt more positive self-perceptions and healthier approaches to eating.

Pressures and Internalization

Consistent with this premise, the women who received the dissonance based intervention (i.e., the CD-combined group) had lower scores on their perception of sociocultural pressures and reported less internalization than the control group at the end of the study. In addition, the Intervention group showed significant changes in both of these variables over the course of the study, suggesting that the creation of dissonance via the intervention assisted them in reducing the amount of social pressure they felt about being attractive and how much they internalized those pressures. There were no changes across time for the control group on these variables. These findings are consistent with previous research (Stice, Mazotti, Weibel, & Agras, 2000), which tested three-week, cognitive-dissonance based interventions with body dissatisfied adolescents. In the Stice et al. (2000) study, the intervention resulted in decreases in thin-ideal internalization relative to the waitlist control group from baseline to termination. In a study that also used a healthy-weight placebo control condition, Stice, Chase, Stormer, and Appel (2001) found that the cognitive dissonance intervention produced the greatest decreases over time in internalization, though the women who were in the healthy-weight group also showed similar, but less pronounced, improvements.

These improvements in the experience of social pressures and the internalization of those pressures are consistent with what would be expected based on dissonance theory. The attitude held by the women, that attaining a certain standard of beauty or achieving a specific body size and shape is directly associated with a multitude of benefits, including success, love, acceptance, and confidence, was directly challenged

through the group experience. Over the course of the six-week intervention, the women in the Intervention groups had numerous discussions, in-session exercises, and homework assignments that put them in the position to challenge and counter body size and self-worth related messages that emanate from peers, family, and the media. In addition, these women engaged in a critical analysis of the thin ideal and the media's portrayal of women, purposefully arguing against and behaving in ways that were counter to the attitude that they held upon entry into the intervention. These challenges led to the experience of dissonance and, ultimately, the decline in levels of the experience and internalization of sociocultural values regarding attractiveness.

Body Dissatisfaction

In terms of socioculturally-based, etiological models about attractiveness, internalization is the immediate precursor and cause of body image concerns (Stice et al., 2001). As such, decreases in internalization would be expected to lead to improvements in body image. Consistent with this theoretical prediction, the women in the CD-combined group reported higher levels of body satisfaction and fewer concerns about body shape and size than the control group at the end of the study. In addition, the intervention led to significant improvements in body image for the women in the CD-combined group over time. These findings are consistent with other research that has used cognitive dissonance interventions (Matusek, Wendt, & Wiseman, 2004; Stice et al., 2006). For example, Stice et al. (2006) randomly assigned 481 adolescent girls who had body image concerns to either a cognitive-dissonance, healthy weight, expressive writing

control, or assessment-only control condition. The girls in the dissonance condition showed the greatest reductions in body dissatisfaction compared to the other three groups, and the healthy weight participants showed significantly greater reductions than the expressive writing and assessment-only participants from pretest to posttest.

The positive changes in body image are particularly salient given that the women across all the groups had similar body mass indices at the beginning and end of the study, suggesting that their weight did not change significantly over time. This finding suggests that improvements in body image were not likely due to changes in the women's physical size, but rather the positive changes they made in their attitudes about women's attractiveness, body shape, and role in society. However, two other processes – social support and group cohesion – also may have contributed to the improvements in the women's body image. Being a part of a supportive, cohesive group, being able to openly and without evaluation discuss issues related to food, eating, body size...etc., and being accepted and appreciated by other women who have similar body image concerns, can help women feel supported, understood, and ultimately, more positively about themselves and their bodies (Yalom, 1995). Being part of a cohesive group and receiving such social support also may provide some psychological “protection” against pressures and forces, such as sociocultural messages about attractiveness, that exist outside of the group setting. Possibly meeting each week with similar peers and gaining a sense of acceptance from the group was important in feeling more satisfied about body size and shape for participants in the CD-combined condition. The control group, which comprised many individuals who did not meet each week and thus did not benefit from such cohesiveness

or support, did not experience any significant changes in their body image over the course of the study.

Negative Affect

Consistent with the sociocultural model of eating pathology (Stice & Agras, 1998), body dissatisfaction (which results from real or imagined discrepancies between women's actual and idealized body shape) is hypothesized to result in negative affect, including symptoms of sadness, anxiety, stress, or shame/guilt (Cole, Martin, Peeke, Seroczynski, & Hoffman, 1998; Rierdan, Koff, & Stubbs, 1998; Stice, Hayward, Cameron, Killen, & Taylor, 2000). This pathway, referred to as the "affect-regulation" pathway, is one of the proposed mechanisms linking body dissatisfaction to disordered eating. Thus, it was expected that the women in this study who experienced reductions in internalization and body dissatisfaction would have subsequent decreases in negative affect as well. That is, there would be what Stice et al. (2007) referred to as a cascade effect, where improvements in variables earlier in the sociocultural model (i.e., internalization) would cause changes in later variables, even though interventions did not directly target these later variables (e.g., negative affect).

Given the results of previous research (Stice, Mazotti, Weibel, & Agras, 1999; Stice, Chase, Stormer, & Appel, 2000; Stice, Trost, & Chase, 2002; Becker, Smith, & Ciao, 2006; Stice, Marti, Spoor, Presnell, & Shaw, 2008) that have shown decreases in negative affect associated with cognitive dissonance based interventions, surprisingly in the current study, no differences were found between the groups at Time 2, and the

women in the CD-combined group did not demonstrate improvements in their mood states over time. Although the participants of the CD-combined group experienced reductions in levels of internalization and body dissatisfaction, and fewer perceived sociocultural pressures, they did not report decreases in their feelings of sadness, anxiety, stress, or guilt/shame over the course of the study. The fact that the current study did not demonstrate improvements in negative affect, yet past research on dissonance-based programs consistently has shown such changes, warrants discussion.

An explanation for the lack of significant findings in the current study may be found in the population studied. In past research where significant improvements were made in negative affect due to involvement in a cognitive-dissonance based intervention, the participants were adolescents who were in high school or young women who were older, but not in college (Stice et al., 2000; Stice, Mazotti, Weibel, & Agras, 1999; Stice, Trost, & Chase, 2002; Stice et al., 2006). However, in studies where college students comprised the entire sample and a dissonance intervention was utilized, there have not been significant reductions in negative affect (Stice & Ragan, 2001; Stice, Orjada, & Tristan, 2006). Thus, it may be that female undergraduates, who are experiencing general developmental tasks and stressors (e.g., separation from parents) as well as those unique to the college environment (e.g., managing existing friendships, establishing new social support networks, increasing academic demands, and greater financial responsibility; Stein, Saelens, Couchis, Lewczyk, Swenson, & Wilfey, 2001), simply are under too high and consistent a level of stress to benefit significantly from three to six week interventions that are not aimed directly at improving their mood state. Younger

adolescents, on the other hand, may benefit from such interventions because the stressors in their environment are neither as consistent nor as extreme. That said, it is important to note that overall levels of negative affect for the college students in this study were only in the low to moderate range, so thankfully these women were not experiencing debilitating levels of distress based on their self-reports.

Dietary Restraint

As predicted by the sociocultural model of eating pathology (Stice & Agras, 1998), improvements in internalization and body dissatisfaction would be related to less need for dieting and fewer bulimic symptoms. Like negative affect, dietary restraint is one of the suggested pathways/mechanisms linking body dissatisfaction to disordered eating (Stice and Agras, 1998). That is, women may respond to their body dissatisfaction (which is based on the real-ideal discrepancy in their body size and shape) by restricting their food intake in hopes of changing their bodies to more closely approximate the societal ideal. Such dietary restraint has been linked to increases in binge eating (Stice et al., 2001) and the development of bulimic symptoms over time. In the current study, the women in the CD-combined, but not in the control group, reported less dietary restraint over the course of the six weeks of the study. Even though these temporal changes occurred only for the women in the CD-combined group, at Time 2, the two groups' scores on dietary restraint still were not significantly different from one another.

These findings are somewhat consistent with previous research that has tested the effects of a solely dissonance-based intervention. That is, in the current study, like in

others (e.g., Stice, Mazotti, Weibel, & Agras, 1999; Stice, Chase, Stormer, & Appel, 2000; Becker, Smith, & Ciao, 2006; Stice, Marti, Spoor, Presnell, & Shaw, 2008), dietary restraint did lessen over the course of the cognitive dissonance intervention. However, at the end of the current study, the cognitive dissonance groups' scores were not significantly lower than the control group as has been found in previous research. For example, Becker, Smith, and Ciao (2005), randomly assigned 150 sorority members to either a dissonance, placebo control, or an assessment-only control group. Compared to the control groups, the participants within the dissonance condition experienced greater reductions in thin ideal internalization, body dissatisfaction, and dietary restraint at the end of the study. In addition, an experiment by Green et al. (2005) found that a high dissonance-induction version of the intervention, which included procedures that enhanced participants level of effort, encouraged participants to publicly share attitudes, and conveyed the perception that participation was voluntary, in comparison to a low dissonance-induction, which included a low level of effort, beliefs that attitudes would be kept private, and communicated that participation was less voluntary, resulted in fewer eating disorder symptoms, including reductions in binge-eating, purging, dieting, and loss of control over eating across the study. Thus, cognitive-dissonance based interventions have demonstrated efficacy for reducing eating disorder symptoms, both bulimic and dietary restraint, in numerous studies and trials.

As previously mentioned, Green et al. (2005) noted significant reductions in eating disorder symptoms, including dietary restraint, with participants in the enhanced dissonance condition. However, these authors also highlighted that at Time 2, there were

no significant differences among the three groups (high dissonance, low dissonance, and assessment-only controls) on the measure of dietary behaviors. These authors explained that their experiment utilized a relatively small sample size ($n = 155$), which may have resulted in inadequate power to detect statistically significant differences between the control and high level dissonance condition. In addition, in Stice, Mazotti, Weibel, and Agras' (1999) study, a small sample ($n = 30$) reduced the statistical power and was a suggested explanation for the lack of significant between group differences, even though there were significant reductions in dieting behaviors for the dissonance group from baseline to termination. In the current study, the sample size ($n = 77$) was larger than the Stice et al. (1999) study, but half that of Green et al. (2005). In the between group analyses for dietary restraint, actual power was 0.13, which is quite low and a likely explanation for the lack of statistical significance. In considering this explanation, it also is important to consider the actual effect size, which was 0.46 (moderate), suggesting that there is a meaningful effect to the intervention, but the small sample size (and low power) affected our ability to detect that effect and label is statistically significant. In addition, it is not surprising that effect sizes were smaller for dietary restraint than for pressures, internalization, and body dissatisfaction because the intervention targeted these last three constructs. Changes in dietary restraint were expected as part of the cascade effect, that is, improvements in internalization and body dissatisfaction would lead to later changes in dietary restraint, which may take some time to stabilize.

Bulimic Symptoms.

In the sociocultural model of eating pathology (Stice & Agras, 1998), affect regulation and dietary restraint are the two pathways that connect body dissatisfaction and bulimic symptoms. Within each pathway, the end result is binge eating, which is the immediate precursor to the bulimic symptoms. Women may binge eat to cope with and lessen their immediate negative emotions or in response to the physical hunger they are experiencing as a result of their dietary restraint. In both cases, the binge may be followed by additional negative emotions (e.g., guilt, shame) and a recommitment to lose weight and to exert rigid control over their food intake. When they fail at that again, and binge eat, the cycle that is bulimia nervosa is established. In accordance with this model, it would be expected that female college students in the dissonance intervention who experienced a reduction in internalization levels, body dissatisfaction, and dieting behaviors, also would experience a significant reduction in bulimic symptoms over time. Although the women in the CD-combined groups experienced this result, participants in the control condition, who did not report reductions in perceived pressures, internalization levels, and body dissatisfaction, also experienced significant decreases in bulimic symptoms over the course of the study, which likely contributed to the non-significant between group findings.

Reductions in bulimic symptoms within the CD-combined are consistent with previous research (Stice, Mazotti, Weibel, & Agras, 1999; Stice & Ragan, 2002; Becker, Smith, & Ciao, 2006; Stice, Shaw, Burton, & Wade, 2006) and would be expected based on the content of those interventions. Although it would not be theoretically expected for

women in the control group to experience decreases in bulimic symptoms, such declines have been found in previous research. That is, in past studies, researchers have noted significant decreases over time in bulimic symptoms for women who were in assessment-only, wait-list control groups (Stice, Trost, & Chase, 2002; Stice, Orjada, & Tristan, Stice, Marti, Spoor, Presnell, & Shaw, 2008). For example, Stice et al. (2002) observed reductions in bulimic symptoms among wait-list controls at the termination of the three week program and at 1-month follow-up. In another study, Stice, Orjada, and Tristan (2006) conducted a controlled trial of a psychoeducational eating disorder intervention among 95 college women, and noted reductions in bulimic symptoms among assessment-only control group participants at post-test and six-month follow-up. Finally, Stice et al. (2008) conducted a study utilizing 481 adolescent females randomized to a dissonance, healthy-weight, expressive writing, and assessment-only control condition. The participants in the assessment-only control condition experienced reductions in bulimic symptoms at 2-year and 3-year follow ups, to the extent that the assessment-only control group had greater reductions in reported bulimic symptoms than the dissonance group at the 3-year follow up. In these studies, though, the researchers did find statistically significant between group differences at the end of the study, which may have been due to the larger sample sizes and higher power for their statistical tests (unlike the current study where actual power for the between group tests was 0.23 for bulimic symptoms). Thus, there does appear to be a natural improvement in bulimic symptoms over time that is reported by female undergraduates. This decrease, however, may be heightened by

involvement in a dissonance-based intervention, though the extent of the effect may only be moderate.

Final Summary

In this study, the CD-combined intervention produced the strongest and most improvements in the variables in comparison to the control group, which supports previous research examining the cognitive-dissonance approaches of eating disorder intervention (Matusek, Wendt, & Wiseman; Mitchell, Mazzeo, Rausch, & Cooke, 2007; Roehrig, Thompson, Brannick, & van den Berg, 2006; Stice, Chase, Stormer, & Appel, 2001; Stice, Marti, & Spoor, 2008; Stice, Mazotti, Weibel, & Agras, 2000; Stice, Presnell, Gau, & Shaw, 2007; Stice, Shaw, Burton, & Wade, 2006; Stice, Trost, & Chase 2003). Specifically, the dissonance-based intervention produced significant reductions in levels of internalization, perceived social pressures, and body dissatisfaction in comparison to the control condition; this group also experienced significant reductions in dietary restraint and bulimic symptoms over the course of the study. Within the content of the cognitive-dissonance and combined cognitive-dissonance programs, persuasion principles are utilized (McGuire, 1961; McGuire, 1985). Specifically, cognitions/attitudes are strengthened by countering and refuting beliefs, ideas, and values that have already been accepted to be true. McGuire (1961) found ‘practicing’ counter-arguments to be effective when attempting to ‘take on’ a new idea. Through the 6-week programs, participants in the CD-combined groups had the opportunity to become more aware of what their beliefs and values about women and attractiveness were, to learn how

they could counter some of the pressures they experience (e.g., identify previous/current cognitions about sociocultural pressures, importance of the thin ideal, etc.), and then actively engage in role-plays and behavioral change exercises to continue this negation (e.g., begin to identify new cognitions to replace old belief system). Thus, the use of practicing counter statements/arguments, both in and out of the intervention sessions, seems to be a key component for developing dissonance and ultimately bringing about attitude change. The fact that this approach was not present for the women in the control group may help explain why differences were noted on social pressures, internalization, and body dissatisfaction.

In addition, the CD-combined program also makes use of strategic self-presentation (Cialdini & Goldstein, 2004) to promote a reduction in maladaptive attitudes and behaviors. In the cognitive-dissonance and combined cognitive-dissonance programs, participants engage in activities in which they voluntarily and publicly criticize the thin ideal to reduce thin ideal internalization. Theoretically, people who make public commitments to change behaviors are more likely to enact these changes because the increased accountability and a desire to be consistent in their actions. In a previous prevention program (Neumark-Sztainer et al., 1995), role-play exercises involving strategic self-presentation (refusing pressure to be thin) were used and found to be effective in reducing eating disorder symptoms.

In addition, the cognitive-dissonance and combined cognitive-dissonance program makes use of a motivational enhancement technique (Miller, 1983). Specifically, in the dissonance-based program, participants discuss the costs of pursuing the thin ideal

through written exercises in the workbook and also in discussion with other group members. Theoretically, these exercises increase the likelihood that participants will engage in the program and make changes to their maladaptive attitudes and behaviors because the exercises emphasize individual responsibility and promote internal attribution for attitudinal and behavioral change. In accordance with this interpretation, dismantling studies, which break down individual, specific components within the dissonance program, indicate that the procedures used in the dissonance program contribute to the observed effects of this intervention (Green et al., 2005; Roehrig et al., 2006). That is, participants will believe these attitudes and behaviors were taken on voluntarily, and will engage in different behaviors as they take on different attitudes to restore consistency, contributing to healthier attitude and behavior change. In addition, in a meta-analytic review of eating disorder prevention programs (Stice, Shaw, & Marti, 2007), it was suggested that other prevention programs that have not produced intervention effects for eating disorders that persist through follow-up typically have not included strategic self-presentation and motivational enhancement exercises. Future research should continue considering ways to increase the use of strategic self-presentation and motivational enhancement components to these and other prevention programs in an effort to produce larger and more persistent intervention effects.

Limitations

There are limitations to this study that warrant discussion. First, all the data were self-report. As such, it is possible that the women did not respond honestly to all the

questions. For example, the women may have over-reported their levels of satisfaction or under-reported their dieting or disordered eating behaviors. In this study, it seems likely that underreporting of pathology occurred. As with all self-report measures, it is difficult to determine whether or not the participants responded to the items honestly. Even so, only psychometrically sound measures were used and data were collected anonymously to reduce self-presentation bias. Second, the relatively small sample size of this study limited our statistical power and the ability to detect otherwise potentially significant findings. In future studies, it may be important to use a larger sample size in order to enhance the power of the analyses and provide further clarification of the significance and size of any observed effects within and between the intervention groups. Third, because the participants were only assessed at the termination of the interventions, there is no way of knowing whether these effects persist over time. Although it was the intent of the researcher to conduct three month follow-ups, the logistics of collecting data at four different institutions across four different semesters made that task impossible to complete. Thus, future research should focus on obtaining follow-up measures at three, six and possibly 12 months after completion of the intervention to determine if initial effects last over time. In addition, future research may want to test the effects of “booster” sessions (i.e., one hour meetings with group members to reinforce the learning that occurred during the intervention) on the maintenance of initial improvements and whether such sessions may even promote further changes. Fourth, there was not complete random assignment. However, efforts were made to counter-balance the groups; that is, certain groups were chosen to be run at certain locations in order to have

equal group membership at the conclusion of the study. Thus, the individuals at these locations were not completely randomized to one of the four conditions as all four groups were not always simultaneously offered during the semester.

Implications for Counseling

The dissonance-based intervention has demonstrated that the components within this approach could be potentially helpful in reducing risk factors for eating disorders as well as directly decreasing disordered eating behaviors within the female college population. Given that many female college students are body-dissatisfied and could potentially benefit from this type of program, it may be fruitful to begin implementing these types of groups within the college campus. For example, these groups could be offered and open to the general female college population at the college counseling center, or they could be offered to specific sub-groups of the university, such as first-year students who are beginning their adjustment to college. In particular, these interventions could be helpful to the many college students who do not meet criteria for a diagnosable eating disorder, but are struggling to understand and accept their body size and shape, and could benefit from meeting with a group of 'similar others' to negotiate these difficulties within a supportive and safe environment.

In addition, on a more specific level, the findings from the current study can provide utility in both individual counseling and group therapy settings. In a college counseling center, many females present to counseling with body image concerns or reported disordered eating patterns. Due to the significant findings regarding the

dissonance portion of the intervention programs within the current study, and from the past success of cognitive-dissonance based interventions, it may be help to use some of these same principles within the therapeutic relationship. For example, it may be important to help clients identify their beliefs regarding a certain body size and shape, what values they have placed on this idealized image, and their ‘wishes’ of what they believe will be different for themselves if they achieve a certain body weight. It also may be helpful to begin challenging some of these belief systems while also exploring how some of these beliefs developed. Specifically, what types of messages are the clients aware of within their environment, including family members and peers both at home or in the college setting, and does the client remember any messages from when they were younger about food or having a certain body size and shape (Were there rules for eating in the home? Were the comments made by parents or siblings regarding dieting or being overweight or thin?). In addition, it also may be important to address and discuss sociocultural changes of the female body and current images within the Western culture regarding the ideal body size and shape for females, and how this impacts the clients’ thoughts and feelings about their own body. Further, it is important to discuss the costs and benefits of this pursuit with each client. Through the active engagement of discussion, exploration, validation, reflection, and curiosity, clients may begin to understand and recognize the impact of their belief systems and internalization of cultural ideals, with the hope that this will also induce the adoption of healthier eating attitudes and behaviors. Overall, treatment of body image concerns and disordered eating patterns within female college students may require addressing greater sociocultural ‘norms’ and

taking a multidimensional approach as opposed to just using strict cognitive behavioral techniques or strategies to induce attitudinal and behavior change.

Implications for Future Research

The present findings imply that it is vital to determine ways to enhance the magnitude and duration of the effects of these intervention programs as they have demonstrated efficacy with the use of numerous facilitators and across several universities. Future trials should continue to examine whether effects would be improved by re-testing the current 6-week time frame, or if more sessions could be helpful. Specifically, more sessions may allow group members to establish meaningful relationships with one another providing enhanced support and greater empowerment when attempting to counter sociocultural pressures and internalization, possibly enhancing body satisfaction and positive affect, and subsequently decreasing the risk for disordered eating behaviors. Within this context, it may be important to include a measure of group cohesiveness or perceived support as this factor may impact each member's willingness to continuously engage in the group meetings, which is critical in attempting to internalize new belief systems and behaviors. It also may be useful to examine the combined cognitive-dissonance program again with a larger sample size to more fully examine its potential effects. As noted by Stice et al. (2006; 2008), there may be a synergistic effect in combining cognitive dissonance and healthy weight interventions that translates into even greater improvements than would be found with either intervention on its own. It is also imperative that future intervention trials use

longer-term follow-ups to fully examine the persistence of program effects. In a recent meta-analytic review (Stice et al., 2007), only 16 of 66 eating disorder programs (23%) that have been evaluated in controlled trials produced significant reductions in current or future eating disorder symptoms and only 3 out of 66 (5%) produced intervention effects over at least a 1-year follow-up. Further, the fact that the average follow-up in eating disorder prevention trials is only 4 months (Stice et al., 2007) is an important limitation to address. Thus, as noted previously, researchers will need to examine ways to extend the initial positive effects found in intervention studies over a longer period of time.

In addition, researchers have found that within high-risk women college women, eating pathology continued to emerge at 3-year follow-up extending into young adulthood (Stice et al., 2008). Thus, future research should continue to examine targeted intervention programs within the female college student population to not only help protect them during the college years, but extending through adulthood as well. Once females leave the college environment, broader sociocultural pressures still exist and may continue to impact an individual's levels of internalization and body dissatisfaction, thus the college years may be an especially important time to intervene. Furthermore, it is crucial that researchers continue to research, develop, and test intervention programs within the female college student population to help protect and buffer against factors that may be enhancing a female college student's risk to engage in self-destructive behaviors.

Conclusion

Overall, the participants within the cognitive-dissonance based intervention showed the greatest reductions among eating disorder risk factors of perceived social pressures, internalization, and body dissatisfaction in comparison to the control condition, which experienced significant reductions in bulimic symptoms over the course of the study. Although the dissonance-based groups did not experience reductions in negative affect, these programs have demonstrated that they could be both a viable resource to mental health clinicians within the college setting and could be very important in assisting female college students develop healthier attitudes and behaviors as they negotiate pressures both within the university environment and as part of our overall culture.

Table 1

Correlation Matrix of Measured Variables and Demographic Variables

Variable	1	2	3	4	5	6	7	8	9
1. BULIT-R 1	--								
2. BULIT-R 2	-.60**	--							
3. DRES 1	-.21	.46**	--						
4. DRES 2	-.07	.52**	.68**	--					
5. BAAR-AT 1	-.23*	.30**	.41**	.33**	--				
6. BAAR-AT 2	-.18	.32**	.22	.33**	.54**	--			
7. BAAR-PF 1	-.16	.26*	.42**	.35**	.64**	.53**	--		
8. BAAR-PF 2	-.16	-.33*	.18	.39**	.28*	.70**	.61**	--	
9. SATAQ 1	-.05	.18	.64**	.44**	.43**	.17	.39**	.21	--
10. SATAQ 2	-.07	-.35**	.51**	.58**	.21	.39**	.33*	.50**	.68**
11. PSPS 1	-.01	.29*	.57**	.41**	.39**	.12	.45**	.31*	.52**
12. PSPS 2	.08	.32*	.34**	.50**	.07	.08	.16	.27*	.30*
13. BPSS-BODY1	-.04	-.32*	-.47**	-.39**	-.33**	-.21	-.38**	-.22	-.53**
14. BPSS-BODY2	-.13	-.25*	-.34**	-.40**	-.18	-.16	-.22	-.12	-.40*
15. BSQ 1	-.01	.39**	.67**	.58**	-.43**	.14	.37**	.24	.71**
16. BSQ 2	.03	.45**	.44**	.69**	.06	.20	.16	.43**	.36**
17. SAD 1	.04	.04	.09	.17	.10	.10	.13	.16	.03
18. SAD 2	.06	.13	.19	.28*	.05	.24*	.19	.26*	.03
19. ANXIOUS 1	-.19	.22	.13	.25*	.11	.09	-.06	.09	-.09
20. ANXIOUS 2	-.02	.19	.17	.37**	.18	.28*	.31**	.34**	-.04
21. STRESSED 1	-.08	.23*	.31**	.37**	.26*	.13	.16	.05	.34**
22. STRESSED 2	.01	.21	.17	.29*	.08	.08	.13	.14	.05
23. SHAM/GUIL1	-.15	.23*	.34**	.23*	.43*	.21	.28*	.12	.35**
24. SHAM/GUIL2	-.11	.22	.27*	.41*	.16	.15	.15	.23*	.10
25. NUT-Q 1	-.15	.20	.07	.06	.06	.05	.22	.12	.08
26. NUT-Q 2	.21	-.03	.17	.08	.06	.01	.15	.01	.22
27. AGE	.09	-.06	-.02	-.03	.05	-.004	-.03	-.07	-.18
28. YEAR	-.05	.15	.10	.06	.28*	.25*	.35**	.16	.14
29. BMI-A	.14	.01	-.06	.04	-.04	.02	-.13	.05	-.02
30. BMI-I	.24*	-.01	.04	-.02	-.12	.04	.02	.16	.02
31. MEAN	89.3	58.3	2.74	2.55	2.66	2.33	4.72	4.31	3.21
32. STD. DEV.	9.91	18.7	.99	1.00	.99	.94	1.18	1.20	1.06
33. SKEWNESS	4.21	2.83	.28	1.24	1.87	1.97	3.29	3.72	1.65
34. KURTOSIS	4.71	-.29	-.85	-.96	-.12	-.17	.73	.92	-.42
35. ALPHA	.61	.89	.94	.93	.85	.87	.87	.85	.92

(table continues)

Table 1 (*continued*).

Variable	10	11	12	13	14	15	16	17	18
1. BULIT-R 1									
2. BULIT-R 2									
3. DRES 1									
4. DRES 2									
5. BAAR-AT 1									
6. BAAR-AT 2									
7. BAAR-PF 1									
8. BAAR-PF 2									
9. SATAQ 1									
10. SATAQ 2	--								
11. PSPS 1	.34**	--							
12. PSPS 2	.34**	.70**	--						
13. BPSS-BODY1	-.30*	-.36**	-.31*	--					
14. BPSS-BODY2	-.35**	-.13	-.29*	.80**	--				
15. BSQ 1	.46**	.60**	.45**	-.80**	-.59**	--			
16. BSQ 2	.64**	.36**	.56**	-.46**	-.56**	.59**	--		
17. SAD 1	.06	.11	.30*	-.11	-.07	.07	.05	--	
18. SAD 2	.12	.09	.25	-.25*	-.20	.21	.42**	.52**	--
19. ANXIOUS 1	.30*	.10	.22	.04	.05	.06	.18	.35**	.34**
20. ANXIOUS 2	.20	.11	.20	-.16	-.08	.06	.26*	.35**	.60**
21. STRESSED 1	.34**	.15	.27*	-.28*	-.33**	.26**	.26*	.43**	.35**
22. STRESSED 2	.19	.10	.21	-.11	-.16	.12	.29*	.22	.51**
23. SHAM/GUIL1	.11	.32*	.21	-.27*	-.25*	.41**	.09	.42**	.20
24. SHAM/GUIL2	.25	.22	.36*	-.19	-.15	.30**	.44**	.43**	.63**
25. NUT-Q 1	.13	.10	.14	.02	-.02	.01	-.02	-.04	-.11
26. NUT-Q 2	.14	.05	-.16	-.26*	-.26*	.16	.13	.01	.19
27. AGE	-.18	.08	-.10	-.17	-.07	-.04	-.09	-.09	-.03
28. YEAR	.19	.08	-.08	-.29*	-.26*	.14	.02	-.12	-.02
29. BMI-A	-.02	.15	.22	-.41**	-.42**	.32*	.34**	-.01	.16
30. BMI-I	.10	.11	.14	-.14	-.17	.09	.15	.14	.02
31. MEAN	3.13	2.39	2.26	3.28	3.43	3.36	3.02	2.58	2.42
32. STD DEV	1.22	.88	.73	1.15	1.12	1.30	1.41	1.09	1.02
33. SKEWNESS	3.95	1.70	.56	.06	.42	.70	1.48	.84	1.62
34. KURTOSIS	4.23	-.08	-.97	-.73	-.56	-.97	-.06	-.85	-.66
35. ALPHA	.90	.86	.78	.90	.91	.97	.96		

(table continues)

Table 1 (*continued*).

Variable	19	20	21	22	23	24	25	26	27
1. BULIT-R 1									
2. BULIT-R 2									
3. DRES 1									
4. DRES 2									
5. BAAR-AT 1									
6. BAAR-AT 2									
7. BAAR-PF 1									
8. BAAR-PF 2									
9. SATAQ 1									
10. SATAQ 2									
11. PSPS 1									
12. PSPS 2									
13. BPSS-BODY1									
14. BPSS-BODY2									
15. BSQ 1									
16. BSQ 2									
17. SAD 1									
18. SAD 2									
19. ANXIOUS 1	--								
20. ANXIOUS 2	.45**	--							
21. STRESSED 1	.23*	.51	--						
22. STRESSED 2	.15	.55**	.52**	--					
23. SHAM/GUIL1	.17	.08	.27*	-.02	--				
24. SHAM/GUIL2	.36**	.44**	.29*	.34**	.41**	--			
25. NUT-Q 1	.14	.06	-.09	-.15	.27*	.002	--		
26. NUT-Q 2	-.16	.08	.09	.12	.05	.01	-.08	--	
27. AGE	-.04	.03	-.01	-.01	-.11	-.07	-.11	.03	--
28. YEAR	-.07	.14	-.10	.01	-.07	.02	.26*	.19	.37**
29. BMI-A	.11	.15	.06	.06	.10	.20	-.03	.09	.35**
30. BMI-I	-.21	.05	.10	.06	.08	-.02	.05	.18	.15
31. MEAN	2.92	2.71	3.36	3.29	1.86	1.76	11.2	12.6	21.2
32. STD DEV	1.06	1.05	1.15	1.14	1.06	1.03	1.81	2.04	5.45
33. SKEWNESS	.25	.27	1.69	.87	6.36	5.29	-1.19	-.41	3.35
34. KURTOSIS	-.74	-.83	-.53	-.75	1.92	1.36	1.57	-.86	12.2
35. ALPHA							.33	.66	

(table continues)

Table 1 (continued).

Variable	28	29	30
27. AGE			
28. YEAR	--		
29. BMI-A	.28*	--	
30. BMI-I	.21	.23*	--
31. MEAN	2.40	23.5	20.8
32. STD DEV	1.22	6.22	4.57
33. SKEWNESS	.35	-.41	-1.49
34. KURTOSIS	-1.02	4.18	13.8
35. ALPHA			

Note. BULIT-R = the Bulimia Test-Revised (scores can range from 28 to 140 with higher scores indicating greater endorsement of bulimic attitudes and behavior); DRES = the Dutch Restrained Eating Scale (scores range from 1, *never* to 5, *always*, with higher scores indicating more restrained eating); BAAR (thin = importance of being thin and attractive, fit = importance of being physically fit and in shape; scores for each factor can range from 1, *strongly disagree* to 7, *strongly agree*); SATAQ = the Sociocultural Attitudes Towards Appearance Questionnaire (scores range from 1, *completely disagree* to 5, *completely agree*, with higher scores indicating greater internalization of general societal pressures and standards about attractiveness); PSPS = the Perceived Sociocultural Pressure Scale (scores range from 1, *no pressure* to 3, *some pressure*, to 5, *a lot of pressure*, with higher scores indicating greater levels of perceived pressure to be thin); BPSS = the Body Parts Satisfaction Scale (body = satisfaction with body; scores range from 1, *extremely dissatisfied* to 6, *extremely satisfied*; face = satisfaction with face; scores range from 1, *extremely dissatisfied* to 6, *extremely satisfied*); BSQ = Body Shape Questionnaire-Revised (scores range from 1, *never* to 6, *always*, with higher scores indicating higher body preoccupation); SAD = PANASX item (scores can range from 1, *slightly or not at all* to 5, *extremely*); ANXIOUS = PANASX item (scores can range from 1, *slightly or not at all* to 5, *extremely*); STRESSED = PANASX item (scores can range from 1, *slightly or not at all* to 5, *extremely*); SHAME/GUILT = PANASX item (scores can range from 1, *slightly or not at all* to 5, *extremely*); NUT-Q = Nutrition Questionnaire (scores can range from 0 to 15 with higher scores indicating increased food knowledge); YEAR = year in school; BMI-A = Actual Body Mass Index Scores; BMI-I = Ideal Body Mass Index Scores. $p < .05$; ** = $p < .01$.

Table 2

Means and Standard Deviations of the ANOVAs for the Comparison of the Combined Cognitive-Dissonance and Control Groups on the Time 1 Demographic Data

Variable	CD-COMB ($n = 36$)		CON ($n = 41$)		<i>F</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
AGE	21.0	5.16	21.4	5.82	0.09
BMI-A	22.8	7.50	24.2	4.33	0.99
BMI-I	20.0	5.20	21.6	3.64	2.39
PERIOD	12.5	2.36	12.1	1.29	0.59
CYCLE	10.1	3.40	11.3	2.24	3.04

Note. CD-combined = cognitive-dissonance and combined cognitive-dissonance groups; CON = healthy weight and assessment-only groups; BMI-A = actual body mass index (kg/m^2); BMI-I = ideal body mass index (kg/m^2); Period = age of first menstrual cycle; Cycle = average number of cycles per year.

Table 3

Means and Standard Deviations of the ANOVAs for the Comparison of the CD-Combined and Control Groups for Each Time 1 Variable

Variable	CD-COMB (<i>n</i> =36)		CON (<i>n</i> =41)		<i>F</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
BPSS-BODY	3.41	1.40	3.18	0.97	0.18
BSQ	3.17	1.49	3.53	1.12	0.72
SATAQ	2.91	1.13	3.50	0.88	2.68
BAAR-PF	4.47	1.33	4.93	1.04	1.60
BAAR-AT	2.56	1.03	2.53	0.85	0.75
PSPS	2.13	0.82	2.54	0.83	2.57
DRES	2.56	1.12	2.91	0.88	0.73
BULIT-R	88.4	11.1	89.1	11.5	0.53
SAD	2.55	1.15	2.50	1.16	0.89
ANXIOUS	3.15	1.13	2.78	0.93	1.39
STRESSED	3.10	1.21	3.42	1.16	0.15
SHAME/GUILT	1.90	1.18	1.88	1.05	0.04
NUT-Q	11.3	1.44	11.3	1.57	0.33

Note. CD-COMB = cognitive-dissonance group and combined cognitive-dissonance group; CON = healthy weight placebo-control and assessment-only control; BULIT-R = the Bulimia Test-Revised (scores can range from 28 to 140 with higher scores indicating greater endorsement of bulimic attitudes and behavior); DRES = the Dutch Restrained Eating Scale (scores range from 1, *never* to 5, *always*, with higher scores indicating more restrained eating); BAAR (thin = importance of being thin and attractive, fit = importance of being physically fit and in shape; scores for each factor can range from 1, *strongly disagree* to 7, *strongly agree*); SATAQ = the Sociocultural Attitudes Towards Appearance Questionnaire (scores range from 1, *completely disagree* to 5, *completely agree*, with higher scores indicating greater internalization of general societal pressures and standards about attractiveness); PSPS = the Perceived Sociocultural Pressure Scale (scores range from 1, *no pressure* to 3, *some pressure*, to 5, *a lot of pressure*, with higher scores indicating greater levels of perceived pressure to be thin); BPSS = the Body Parts Satisfaction Scale (body = satisfaction with body; scores range from 1, *extremely dissatisfied* to 6, *extremely satisfied*; face = satisfaction with face; scores range from 1, *extremely dissatisfied* to 6, *extremely satisfied*); BSQ = Body Shape Questionnaire-Revised (scores range from 1, *never* to 6, *always*, with higher scores indicating higher body preoccupation); SAD = PANASX item (scores can range from 1, *slightly or not at all* to 5, *extremely*); ANXIOUS = PANASX item (scores can range from 1, *slightly or not at all* to 5, *extremely*); STRESSED = PANASX item (scores can range from 1, *slightly or not at all* to 5, *extremely*); SHAME/GUILT = PANASX item (scores can range from 1, *slightly or not at all* to 5, *extremely*); NUT-Q = Nutrition Questionnaire (scores can range from 0 to 15 with higher scores indicating increased food knowledge).

* = $p < .05$; ** = $p < .01$; *** = $p < .0001$.

Table 4

Adjusted Means and SEs for the ANCOVAs of the CD-Combined and Control Groups for Each Time 2 Variable

Variable		<i>n</i>	Adjusted <i>M</i>	<i>SE</i>	<i>F</i>
BPSS-BODY	INTERVENTION	41	3.62	0.21	7.98**
	CONTROL	36	3.04	0.12	
BSQ	INTERVENTION	33	2.68	0.16	8.16**
	CONTROL	27	3.40	0.18	
SATAQ	INTERVENTION	33	2.71	0.12	14.5***
	CONTROL	27	3.43	0.14	
BAAR-PF	INTERVENTION	41	4.17	0.18	2.12
	CONTROL	36	4.58	0.20	
BAAR-AT	INTERVENTION	41	2.14	0.14	5.57*
	CONTROL	36	2.65	0.15	
PSPS	INTERVENTION	33	2.10	0.08	6.75*
	CONTROL	27	2.46	0.09	
DRES	INTERVENTION	41	2.50	0.12	1.32
	CONTROL	36	2.76	0.19	
BULIT-R	INTERVENTION	41	57.7	2.30	0.74
	CONTROL	36	61.4	3.59	
SAD	INTERVENTION	41	2.36	0.14	0.33
	CONTROL	36	2.48	0.15	
ANXIOUS	INTERVENTION	41	2.70	0.15	0.97
	CONTROL	36	2.71	0.16	
STRESSED	INTERVENTION	41	3.42	0.16	0.27
	CONTROL	36	3.17	0.17	
SHAME/GUILT	INTERVENTION	41	1.80	0.15	0.99
	CONTROL	36	1.76	0.16	

Note. BULIT-R = the Bulimia Test-Revised (scores can range from 28 to 140 with higher scores indicating greater endorsement of bulimic attitudes and behavior); DRES = the Dutch Restrained Eating Scale (scores range from 1, *never* to 5, *always*, with higher scores indicating more restrained eating); BAAR (thin = importance of being thin and attractive, fit = importance of being physically fit and in shape; scores for each factor can range from 1, *strongly disagree* to 7, *strongly agree*); SATAQ = the Sociocultural Attitudes Towards Appearance Questionnaire (scores range from 1, *completely disagree* to 5, *completely agree*, with higher scores indicating greater internalization of general societal pressures and standards about attractiveness); PSPS = the Perceived Sociocultural Pressure Scale (scores range from 1, *no pressure* to 3, *some pressure*, to 5, *a lot of pressure*, with higher scores indicating greater levels of perceived pressure to be thin); BPSS = the Body Parts Satisfaction Scale (body = satisfaction with body; scores range from 1, *extremely dissatisfied* to 6, *extremely satisfied*; face = satisfaction with face; scores range from 1, *extremely dissatisfied* to 6, *extremely satisfied*); BSQ = Body Shape Questionnaire-Revised (scores range from 1, *never* to 6, *always*, with higher scores indicating higher body preoccupation); SAD = PANASX item (scores can range from 1, *slightly or not at all* to 5, *extremely*); ANXIOUS = PANASX item (scores can range from 1, *slightly or not at all* to 5, *extremely*); STRESSED = PANASX item (scores can range from 1, *slightly or not at all* to 5, *extremely*); SHAME/GUILT = PANASX item (scores can range from 1, *slightly or not at all* to 5, *extremely*).

* $p < .05$; ** $p < .001$; *** $p < .0001$.

Table 5

Means and Standard Deviations for Paired Samples t-tests for the CD-Combined (n = 41) and Control group (n = 36) for all Psychosocial variables from Time 1 to Time 2

Variable		Time 1		Time 2		<i>t</i>
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
BPSS-BODY	INTERVENTION	3.29	1.21	3.63	1.11	-2.66*
	CONTROL	3.18	0.97	3.21	1.11	-0.27
BSQ	INTERVENTION	3.25	1.35	2.65	1.12	2.59*
	CONTROL	3.53	1.12	3.48	1.12	0.46
SATAQ	INTERVENTION	3.08	1.06	2.58	0.39	2.57*
	CONTROL	3.50	0.88	3.59	0.94	-0.88
BAAR-PF	INTERVENTION	4.60	1.22	4.01	1.24	3.11*
	CONTROL	4.93	1.04	4.65	1.07	2.18*
BAAR-AT	INTERVENTION	2.72	1.02	2.14	0.97	4.25*
	CONTROL	2.53	0.85	2.55	0.87	-0.01
PSPS	INTERVENTION	2.17	0.92	2.03	0.78	1.09
	CONTROL	2.54	0.83	2.55	0.55	-0.14
DRES	INTERVENTION	2.71	1.14	2.42	0.98	2.14*
	CONTROL	2.91	0.88	2.70	1.02	1.68
BULIT-R	INTERVENTION	88.6	9.56	56.5	18.6	8.08***
	CONTROL	89.1	11.5	60.2	18.9	6.27***
SAD	INTERVENTION	2.73	1.00	2.41	0.97	1.80
	CONTROL	2.50	1.16	2.42	1.08	0.55
ANXIOUS	INTERVENTION	3.04	1.07	2.76	1.09	1.64
	CONTROL	2.78	0.93	2.64	1.01	0.82
STRESSED	INTERVENTION	3.32	1.12	3.39	1.22	-0.37
	CONTROL	3.41	1.16	3.19	1.06	1.49
SHAME/GUILT	INTERVENTION	1.93	1.15	1.77	0.98	0.81
	CONTROL	1.88	1.06	1.75	1.12	0.71

Note. BULIT-R = the Bulimia Test-Revised (scores can range from 28 to 140 with higher scores indicating greater endorsement of bulimic attitudes and behavior); DRES = the Dutch Restrained Eating Scale (scores range from 1, *never* to 5, *always*, with higher scores indicating more restrained eating); BAAR (thin = importance of being thin and attractive, fit = importance of being physically fit and in shape; scores for each factor can range from 1, *strongly disagree* to 7, *strongly agree*); SATAQ = the Sociocultural Attitudes Towards Appearance Questionnaire (scores range from 1, *completely disagree* to 5, *completely agree*, with higher scores indicating greater internalization of general societal pressures and standards about attractiveness); PSPS = the Perceived Sociocultural Pressure Scale (scores range from 1, *no pressure* to 3, *some pressure*, to 5, *a lot of pressure*, with higher scores indicating greater levels of perceived pressure to be thin); BPSS = the Body Parts Satisfaction Scale (body = satisfaction with body; scores range from 1, *extremely dissatisfied* to 6, *extremely satisfied*; face = satisfaction with face; scores range from 1, *extremely dissatisfied* to 6, *extremely satisfied*); BSQ = Body Shape Questionnaire-Revised (scores range from 1, *never* to 6, *always*, with higher scores indicating higher body preoccupation); SAD = PANASX item (scores can range from 1, *slightly or not at all* to 5, *extremely*); ANXIOUS = PANASX item (scores can range from 1, *slightly or not at all* to 5, *extremely*); STRESSED = PANASX item (scores can range from 1, *slightly or not at all* to 5, *extremely*); SHAME/GUILT = PANASX item (scores can range from 1, *slightly or not at all* to 5, *extremely*).

* $p < .05$; ** $p < .01$; *** $p < .0001$.

APPENDIX A
INTRODUCTION

Eating disorders are prevalent among females and are associated with significant health risks, including death (Hoek & Van Hoeken, 2003). In many Westernized countries, the incidence of anorexia nervosa and bulimia nervosa has drastically increased among adolescents and young women over the last two decades (Kurth, Krahn, & Nairn, 1995; Mintz & Betz, 1988). According to a report in the *New England Journal of Medicine* (Becker, Grinspoon, & Kilbanski, 1999), eating disorders affect an estimated 5 million Americans every year, with female adolescents and young adults comprising the majority of cases. Although clinically diagnosed eating disorders have been found in one to two percent of the female population, the prevalence of subclinical eating disorders is much higher affecting up to 60% of adolescent and college-aged females (Austin, 2000; Mintz & Betz, 1988; Shisslak, Crago, & Estes, 1995). Furthermore, at any point in time, approximately 40-45% of girls and young women are trying to lose weight through various means motivated by “normative” body dissatisfaction (French, Story, & Neumark-Sztainer, 1997). Although males have been shown to weigh more than females, the female-to-male ratios of clinical and subclinical eating disorders is about 9:1 and 3:1, respectively (Levine & Piran, 2004). Females are most likely to experience subsequent increases in body dissatisfaction and eating disorders during and following puberty (Heatherton, Mahamedi, & Striepe, 1997), which also corresponds to confusion surrounding identity, self-esteem, and social acceptance (Thompson, Coover, & Stormer, 1999).

It is clear that eating disorders are a serious health problem that affects a large number of female adolescents and college women. As a result, it is imperative to

continue identifying contextual and intrapersonal variables that may help improve prevention and treatment programs (Kashubeck-West & Mintz, 2001). In particular, counseling psychologists must focus on developing and updating programs that help protect and buffer against causal risk factors and thus reduce females risk of engaging in disordered eating (Lewinsohn, Striegel-Moore, & Seeley, 2000; Patton, Selzer, Coffey, Carlin, & Wolfe, 1999).

Eating Disorders

Definition

Anorexia nervosa is characterized by the refusal to maintain a minimally normal body weight (i.e., below 85 % medically ideal body weight), profound fear of weight gain, body image disturbance, and amenorrhea (American Psychiatric Association [APA], 1994). Bulimia nervosa involves recurrent episodes of binge eating in which the individual consumes an excessive amount of food in a small time frame and feels a lack of control over the behavior (APA, 1994). Following the binge, the bulimic will engage in compensation, usually in the form of laxatives, excessive exercise, fasting, or self-induced vomiting. Additionally, the individual's self-esteem is significantly influenced by body weight and shape (APA, 1994). Although anorexia and bulimia are the most widely recognized forms of an eating disorder, there is also a third clinical category for eating pathology. This diagnosis, eating disorder not otherwise specified (EDNOS), is given to individuals who do not meet criteria for anorexia and bulimia but still possess significant symptoms of eating pathology. An EDNOS diagnosis implies that an

individual exhibits all the characteristics of anorexia or bulimia with the exception of one symptom or behavior (i.e., has regular menses instead of amenorrhea, weight is in a normal range, less frequent bingeing, etc.). Research studies have suggested that although individuals with EDNOS do not meet formal diagnostic criteria for AN or BN, these individuals possess clinically significant symptomology warranting professional attention (APA, 1994; Dancyger & Garfinkel, 1995; Franko & Omori, 1999).

In addition to the formal eating disorder diagnoses, there exist subclinical presentations of eating disorders (Beals, 2000). In these instances, individuals may have some eating and body-weight problems but fail to meet all of the DSM criteria for anorexia, bulimia, or EDNOS (Beals & Manore, 1994). These symptoms may include behaviors such as restricting food intake or bingeing on food, excessive exercise, occasionally purging, or the use of laxatives or weight loss pills. However, these behaviors may not occur on a daily basis and generally are not as extreme as individuals exhibiting diagnosable eating disorder symptoms. Women with subclinical eating disorders often experience levels of emotional distress similar to those of individuals with clinical levels of eating pathology (Bunnell, Shenker, Nussbaum, 1990).

Prevalence and Age of Onset

Research has suggested that approximately 90% of individuals who present for eating disorder treatment are female (Mussell, Binford, & Fulkerson, 2000; Lewinsohn, Striegel-Moore, & Seeley, 2000; Stice, Killen, Hayward, & Taylor, 1998). Recent studies have found that 0.5 to 1.0% of females in the United States meet full criteria for

anorexia nervosa (APA, 1994). Bulimia nervosa has been shown to be more prevalent than anorexia nervosa, with estimates ranging from 1 to 3% of women, yet occasional symptoms of this disorder have been reported in up to 40% of college women (Kaplan & Sadock, 1998).

As compared to the overall general population and male college students, research has demonstrated that eating pathology prevalence rates are significantly higher among female college students (Dancyger & Garfinkel, 1995). According to Mintz and Betz (1988), 3% of college women reported clinical levels of bulimia and 69 to 73% engage in dieting behaviors. Other studies have reported that 20% of college women experience a diagnosable eating disorder (Cavanaugh & Lemberg, 1999) and that up to 60% of college women have reported subclinical symptoms, such as engaging in some type of bulimic behavior (Cooper, Charnock, & Taylor, 1987; Mintz & Betz, 1988).

The typical onset for anorexia nervosa in females occurs between the ages of 10 and 30, with 17 to 18 being the mean age of onset (APA, 1994). It is estimated that 85% of women diagnosed with anorexia nervosa experience an onset of the disorder between the ages of 13 and 20 (Kaplan & Sadock, 1998; Stice et al., 1998); onset is typically associated with a stressful life event (APA, 1994). Bulimia nervosa usually begins in late adolescence or early adulthood, often with the binge eating coinciding with an episode of dieting (APA, 1994). There is no clear time frame on when subclinical eating disorders develop, however, by the time a female enters college, these maladaptive eating behaviors are present and have the potential to become more severe as the individual progresses in a university environment (Beals, 2000).

Risk Factors

The development of an eating disorder can best be conceptualized as multidimensional in nature, including sociocultural, developmental, psychological, environmental, familial, and biological factors (Mussell, Binford, & Fulkerson, 2000). Industrialized, Westernized societies, which place an emphasis on beauty as a core aspect of femininity and the main source of achievement, exhibit higher rates of eating disorders than other non-Westernized cultures or environments (Dolan, 1991; McCarthy, 1990). The pursuit and internalization of unrealistic ideals of thinness (the “thin ideal”) may be attributable in part to repeated exposure to and internalization of message that glamorize and glorify excessive thinness (Irving, 1990; Stice, Schupak-Neuberg, Shaw, & Stein, 1994). Increased acceptance of these sociocultural messages that advertise the “superwoman ideal,” a female who overachieves in beauty, relationships, and career, may lead to confusion regarding role expectations (Steiner-Adair, 1994). For some individuals, striving for thinness may appear to be a concrete strategy for “fitting in” and feeling more accepted and successful in society. For example, Yuker and Allison (1994) reported that females pay higher consequences than males do in terms of dating, education, and employment opportunities when they fail to meet societal ideals. Thus, many women see attractiveness as the key to success and acceptance, choosing to pursue society’s thin-ideal as a means of achieving these outcomes (Fredrickson & Roberts, 1997).

Women who accept (or internalize) these sociocultural standards of thinness may become dissatisfied with their bodies and subsequently engage in restrictive or

compensatory eating behaviors to change how they look (Mussell, Binford, & Fulkerson, 2000). Body dissatisfaction significantly enhances the risk for eating pathology through two pathways – dieting and negative affect (Attie & Brooks-Gunn, 1989; Leon, Fulkerson, Perry, & Early-Zald, 1995; Stice & Shaw, 2004). For example, numerous studies have found that the sociocultural pressure of media-portrayed thin-ideal images fosters body dissatisfaction and subsequent disordered eating behaviors. Stice et al. (2001) proposed the pathway approach to the development of eating disturbances. It was suggested that internalization of the thin-ideal and body dissatisfaction are pathways that may mediate the relationship between sociocultural pressures and eating disorders. Within this model, it is suggested that repeated exposure to sociocultural pressures to be thin foster body dissatisfaction and internalization of the thin-ideal. As young women seek to develop a positive sense of identity, striving to attain the ideal thin physique may be viewed as a concrete, tangible strategy for obtaining social approval (Striegel-Moore et al., 1986). However, because achieving this thin-ideal is an unrealistic goal for many females, internalization may result in dissatisfaction with one's body, leading to negative affect and compensatory behaviors (Stice et al., 2001).

Research has demonstrated the validity of this model, with results suggesting that sociocultural pressures to be thin, thin-ideal internalization, body dissatisfaction, dieting, and negative affect predispose the onset of bulimic symptoms (Stice et al., 1998). In addition, Twamley and Davis (1999) used a multiple regression analysis to demonstrate that internalization of the thin-ideal and dissatisfaction with one's body mediated a relationship between sociocultural pressures to be thin and eating pathology. In another

attempt to evaluate his model, Stice (2001) utilized growth curve modeling and data from three different time periods. He concluded that sociocultural pressures to be thin and internalization of the thin-ideal predicted increases in body dissatisfaction. Initial body dissatisfaction predicted enhanced dieting behaviors and negative affect, which further increased bulimic pathology.

Numerous studies also have indicated that exposure to thin-ideal images may result in body dissatisfaction, further enhancing an individual's risk for disordered eating (Attie & Brooks-Gunn, 1989; Leon, Fulkerson, Perry, & Cudeck, 1993). Specifically, portrayals of feminine beauty and success in the media are believed to have an important influential role in the process of females internalizing the thin-ideal (Levine & Smolak, 1996). In one study, Irving (1990) showed slides of thin, average, and overweight models to different group of female undergraduates. Following these "slide shows," it was found that the group of females that viewed the thin models experienced significantly lower body satisfaction than the females who were exposed to the slides of average or overweight models. Furthermore, in a meta-analysis examining the effects of exposure to media-portrayed thin-ideal images, Groesz, Levine, and Murnen (2002) found significant increases in body dissatisfaction among women who viewed thin media images, as compared with those who looked at average size models, plus size models, or inanimate objects.

To provide further evidence of the relationship of media exposure, Field et al. (1999) found that adolescent girls who tried to look like women portrayed in the media became more concerned with their weight than their peers and were more likely to vomit

and use laxatives the more their peers glorified thinness. Magazine images reflecting thin-ideal images also had a similar effect, promoting body dissatisfaction and disordered eating patterns among women (Harrison & Cantor, 1997). Specifically, experimental studies have found that women exposed to magazine pictures of ultra-thin models reported experiencing many negative emotions, including significant increases depression, stress, guilt, shame, insecurity and body dissatisfaction (Harrison & Cantor, 1997).

In the second part of the eating disorder pathway, once females are exposed to sociocultural images and ideals of thinness, internalization occurs and is related to eating disorder symptomatology among samples of college women (Heinberg, Thompson, & Stormer, 1995; Stice, et al., 1996). Women who internalize societal messages regarding ideals for attractiveness often compare their bodies with the accepted and “advertised” society beauty ideals (Stice, 1994). However, as these ideals are impossible for most women to attain (Maine, 2000), they are left feeling negatively towards their bodies (Fredrickson & Roberts, 1997). In two studies, Griffiths and colleagues (Griffiths, Beaumont, Russell, Schotte, Thornton, Touyz, & Varano, 1999; Griffiths, Mallia-Blanco, Boesenberg, Rischer, Taylor, & Wyndham, 2000) stated that the awareness and internalization of sociocultural attitudes related to attractiveness were significantly and positively correlated to measures of eating pathology. Additionally, Stice and Shaw (1994) found a strong positive relationship mediating internalization of the thin-ideal and disordered eating. In studies where the thin-ideal internalization has been experimentally reduced, Stice and colleagues reported improved body satisfaction, less dieting behavior,

increased affect, and reduction in bulimic symptoms among female high school and college students (Stice et al., 2000; Stice et al., 2001).

In the third part of the proposed eating disorder pathway, once ideals and messages have been experienced and internalization occurs, there are subsequent increases in body dissatisfaction resulting in negative affect and increased dieting behaviors. Experiencing negative self-evaluation (Fairburn, Welch, Doll, Davies, & O'Connor, 1997), low self-esteem (Button, Sonuga-Barke, & Davies, 1996), and perceived ineffectiveness (Striegel-Moore et al., 1989) also have been identified as potential risk factors for eating disorders. Stice and colleagues (Stice, Akutagawa, Gaggan, & Agras, 2000; Stice, Ziemba, Margolis, & Flick, 1996) emphasized that negative affect and dietary restraint are important triggers for the development of bulimic pathology. Studies have suggested bulimics report more depression, increased anxiety, and lower self-esteem when compared to non-bulimics (Mintz & Betz, 1988; Vitousek & Manke, 1994). Many bulimic women report periods of increased depression, anxiety, and feelings of inadequacy prior to engaging in binge-eating behaviors (Steinberg, Tobin, & Johnson, 1990). Additionally, negative affect has been shown to predict the onset of bulimia (Stice & Agras, 1998) and increases in bulimic behavior (Stice, 2001). Stice and Shaw (2004) were able to confirm a relationship between negative affect and eating pathology by incorporating the thin-ideal (the amount to which individuals believe in the “culturally prescribed” ideal body image for women) in their research investigating eating disorders. Using magazine pictures of ultra-thin models, average-sized models,

and pictures without the presence of models, Stice and Shaw found that exposure to the ultra-thin models resulted in depression, guilt, shame, insecurity, and stress.

Previous research also has demonstrated that perceived pressure to be thin, body mass, thin-ideal internalization, body dissatisfaction, dieting, and negative affect have been found to predict the onset of bulimic pathology among initially asymptomatic participants (Stice & Agras, 1998; Stice, Killen, Hayward, & Taylor, 1998). More specifically, researchers have proposed a relationship between emotional distress and bulimic symptomatology because it is hypothesized that women use binge-eating as a method of comfort, a means to lessen negative affect (Humphrey, 1986). Similarly, purging behavior might be used to reduce feelings of shame, guilt, and depression that may result from the binge-eating episodes (Johnson & Larson, 1982).

In addition to the psychosocial factors described previously, developmental stages and life transitions also must be considered to more fully understand the onset of eating disorders (Mussell, Binford, & Fulkerson, 2000). Smolak and Levine (1996) suggested that eating disorders are more likely to develop when individuals are having difficulty adjusting and adapting to developmental challenges. For example, body image dissatisfaction and increased concerns about eating have been associated with the developmental changes associated with puberty (Shisslak, Crago, Estes, & Gray, 1996). During puberty, young women naturally begin gaining and storing fat in their bodies, which may be emotionally distressing and lead to greater dissatisfaction with body size and shape. To cope, some individuals may resort to extreme dieting in an effort to counter these biological effects and return to a pre-pubertal body shape. Research has

suggested that early pubertal maturation has been found to put girls at increased risk for disordered eating (Fairburn, Cooper, & Doll, 1999; Graber, Lewinsohn, Seeley, & Brooks-Gunn, 1997).

Research collected on college campuses suggests that the transition to college also may be a particularly threatening time for some individuals and exacerbate eating disordered behaviors. For example, as many as 38% of college students exhibit subclinical levels of anorexic and bulimic behaviors and 44% have chronically dieted (Holston & Cashwell, 2000). Mintz and Betz (1988) estimated that 64% of college women show some symptoms of eating disordered behaviors such as bingeing, purging, and restricting. Further, 67 to 73% of women reported engaging in dieting behaviors, whereas 60 to 86% have reported acknowledging subclinical symptoms of bulimia and binge eating (Alexander-Mott & Lumsden, 1994; Mintz & Betz, 1988). Research also has suggested that some women who have subclinical levels of eating disturbances at entrance to college may eventually develop diagnosable eating disorders (Drewnowski et al., 1994; Holston & Cashwell, 2000), and that dieting at the beginning of the freshman year for females was found to be the best predictor of bulimic behavior at the end of the first year of college (Krahn, Kurth, Bohn, Olson, Gomberg, & Drewnowski, 1995).

This transitional period to college, which appears associated with high levels of disordered eating, is a risk period for many reasons. During this time, students are experiencing normative developmental tasks such as forming sexual and nonsexual relationships, separating from family and friends, increasing sense of identity (Lacey, Coker, & Birtchnell, 1986; Smolak & Levine, 1996), and meeting academic demands

(Levine, Smolak, Moodey, Shuman, & Hessen, 1994), which may increase the likelihood of developing disordered eating behaviors in women. In addition to these normative tasks, other stressors, such as managing existing friendships, gaining autonomy from family, changing social support networks, and increasing financial responsibility may contribute as well (Stein, Saelens, Couchis, Lewczyk, Swenson, & Wilfey, 2001). In the eating disorder pathway described earlier, these individuals may be experiencing enhanced body dissatisfaction or confusion during this time period (as they are attempting to make new friends and/or determine self-identity), which places them at a greater risk for dieting behaviors, negative affect, and eating disorder symptoms. Female college students also appear to be particularly at risk for eating disorder due to these increases in peer pressure, academic stress, independence, and difficulties adapting to a new environment (Mintz & Betz, 1988; Striegel-Moore et al., 1989).

In college, women also may feel peer pressures to be thin (Irving, 1990), especially when engaging in comparisons within a social context (such as in dorms, sororities, shared housing, or in classes). Pressure from peers also may take place in the form of socialization, the process of attitudes or behaviors spreading from one group to another (Zalta & Keel, 2006). Socialization predicts that over time, the social pressure toward uniformity has a causal effect on an individual's behavior. To demonstrate the impact of socialization on eating disorder symptoms, Crandall (1988) studied residents of two sorority houses within a college campus. He found that throughout the fall and spring semester, bulimic symptoms increased among friendship groups and within sororities, reflecting the strength of "social contagion" effects. As individuals within a

group began to exhibit or subscribe to particular maladaptive attitudes and behaviors, other group members were more likely to adapt these similar beliefs and behaviors. In accordance with the eating disorder pathway model, when individuals are exposed to certain “normative” messages (from the media or simply from peers) that are internalized, there is an increased susceptibility for body dissatisfaction and subsequent negative affect and dieting behaviors, enhancing the risk for experiencing an eating disorder. Within college environments, it is unrealistic to believe that women will not be affected by the numerous social influences and “normative” ideals and messages of thinness. Therefore, it is not surprising that these influences greatly impact and challenge an individual’s identity and self-esteem, placing college students at a heightened risk for the development of an eating disorder.

Summary

Females between the ages of 13 to 20 are at a heightened risk for developing unhealthy eating attitudes and behaviors (Mussell, Binford, & Fulkerson, 2000; Kaplan & Sadock, 1998; APA, 1994). Specifically, female college students appear to be particularly at risk for the development of eating disorders due to increases in independence, peer pressures, academic stress, and/or difficulty in transitioning to a new environment (Mintz & Betz, 1988; Striegel-Moore, Silberstein, Frensch, & Rodin, 1989). Studies have indicated that as many as 20% of college women struggle with a diagnosable eating disorder (Cavanaugh & Lemberg, 1999), as many as 50% engage in some form of bulimic behavior (Copper et al., 1987), and 69 to 73% report dieting

behaviors (Mintz & Betz, 1988). Therefore, because of the high prevalence of eating disorder symptomatology among female undergraduates, college campuses would be ideal places to conduct eating disorder intervention programs. These women appear to be at enhanced risk and thus may benefit substantially from programs aimed at reducing this risk. Specifically, programs that increase the awareness of the environmental messages of thinness and subsequently decrease risk of internalization, improve body satisfaction and self-esteem, enhance food knowledge, and de-mystify and provide accurate knowledge regarding “fad diets” and dieting. In addition, college may serve as not only a time and place to develop disordered eating, but a time and place to learn how to have a healthy relationship with food and one’s own body (Martz, Graves, & Sturgis, 1997).

Eating Disorder Prevention and Intervention Programs

Eating disorders are one of the most common psychiatric problems for women and girls, resulting in extreme distress and functional impairment, as well as inpatient hospitalization, suicide attempts, and mortality (Lewinsohn, Striegel-Moore, & Seeley, 2000; Patton, Selzer, Coffey, Carlin, & Wolfe, 1999). Disordered eating also may increase the risk of depressive disorders, anxiety disorders, substance abuse, and general health problems (Johnson, Cohen, Kasen, & Brook, 2002). Because previous research has indicated that individuals who suffer from eating disorder symptoms are not likely to seek treatment (Welch & Fairburn, 1994) and that intervention effects are greatest for people with initial elevations in disordered attitudes and behaviors (Franko, 1998), intervention programs aimed towards this specific female population (e.g., targeted) may

help reduce eating pathology and create healthier alternatives. Specifically, programs aimed toward individuals with initially elevated symptoms produce the greatest effects (Lowry-Webster, Barrett, & Dadds, 2001; Stoolmiller, Eddy, & Reid, 2000), because the subjective distress that characterizes high-risk individuals motivates these participants to become more engaged in the program. Additionally, strategies, such as implementing intervention or prevention programs, to interrupt the progression of disordered eating patterns at the earliest possible stage (e.g., when individuals are most at risk to become body dissatisfied and/or develop disordered eating attitudes or compensatory behaviors) are imperative to minimize any harmful effects and to attain psychological and physical well-being.

Definition

A successful eating disorder program reduces current or future eating disorder symptoms or rates of clinically significant eating pathology relative to the changes in these outcomes observed in a control group. Interventions that focus primarily on risk factors function under the assumption that a reduction in these factors should induce decreases in eating pathology. Specifically, the intervention effects on eating pathology are mediated by reductions in risk factors. Although many interventions are aimed towards decreasing risk factors, an eating disorder program is considered successful if there are reductions in current or future eating disorder symptoms or decreases in the rates of clinically significant eating pathology relative to the changes in these outcomes observed in a control group (Stice & Shaw, 2004).

History

Initial prevention programs for eating disorders consisted primarily of didactic psychoeducation and were usually aimed at adolescents (Carter, Stewart, Dunn, & Fairburn, 1997; Moreno & Thelen, 1993). The idea behind such programs was that information about the adverse effects of eating disorders would prevent individuals from using maladaptive methods as a means of weight control (Stice & Shaw, 2004). For example, most programs taught students about natural changes in body composition associated with physical maturation and encouraged development of a positive body image.

Although the first intervention programs had good intentions, they were not entirely effective in reducing eating pathology (Stice & Shaw, 2004). Thus, the second phase of eating disorder prevention programs was developed. These programs also were didactic in format but included information on resisting the sociocultural pressures of thinness and suggestions for healthy weight-control methods (Neumark-Sztainer, Butler, & Palti, 1995). These programs were developed under the idea that sociocultural pressures were extremely important in the development of eating disorders and that extreme dieting and compensatory behaviors emerged as a result of trying to meet “appropriate” cultural standards of weight. For instance, these programs included a component that aimed to facilitate knowledge of and resistance to negative media images about eating and body image and a component to develop coping skills to resist sociocultural pressures for thinness and dieting.

Neumark-Sztainer et al. (1995) involved school teachers in an adolescent-focused prevention program, providing them with specific training in eating disorder prevention. The teachers also encouraged students to resist harmful media messages and to create healthier norms within the classroom environment as well as within their families and peer groups. Implementation of this program required teachers to use a curriculum that expanded beyond specific target behaviors (e.g., dieting) and addressed social-environmental issues on systemic as well as individual levels. Session content included nutrition and body image issues as they pertain to adolescent changes, healthy eating guidelines and specific nutritional principles (e.g., food pyramid), exercise and behavior modification for weight management, evaluation of messages from weight loss advertisement and media images related to body image and self-esteem, education about prevention of anorexia nervosa and bulimia nervosa, and the importance of resisting harmful social norms and actively modifying the immediate social environment. Various activities were used to enhance participation, including preparing posters, sharing reactions to films, working on activities in small groups, actively creating a project, and discussing issues with the larger group.

The third wave of interventions, which represents the structure and methodology behind the most recent prevention programs, include selective programs that target high-risk individuals with interactive exercises that focus on risk factors that have been identified to predict onset of eating pathology (e.g., internalization, body dissatisfaction). The effects of these programs offered to high-risk individuals have been shown to be more effective than universal programs offered to all available participants (Stice,

Mazotti, Wiebel, & Agras, 2000). Because individuals with initially elevated symptoms may be experiencing more distress, they may be more willing to commit themselves to the eating disorder programs, enhancing the desired effects (Stoolmiller, Eddy, & Reid, 2000). Additionally, the interactive programs are more likely to involve exercises that allow participants to apply the skills taught in the intervention, which may increase skill acquisition (Stice & Shaw, 2004).

Participant Sex

Studies have suggested that girls and women are much higher at risk for eating pathology than boys and men (Lewinsohn et al., 1993; Newman et al., 1996). Thus, girls and women may be expected to be more likely to participate in and benefit from eating disorder prevention programs than boys and men. In addition, the low base rate of eating pathology in boys and men might produce a floor effect that makes it difficult to observe intervention effects (Stice & Shaw, 2004).

Participant Age

Previous research has shown that disordered eating is most likely to emerge between the ages of 13 and 20 in females (Lewinsohn et al., 2000; Stice et al., 1998) and that the rates of eating pathology are very low prior to adolescence (e.g., 9 to 11 years old) (Keel, Fulkerson, & Leon, 1997; Stice, Presnell, & Bearman, 2001). It also has been suggested that prevention programs are most effective when delivered during the developmental period in which the “pathological condition” emerges (Maggs,

Schulenberg, & Hurrelmann, 1996). Accordingly, clinicians have reported that adolescents younger than 15 often have not experienced sufficient subjective distress to motivate them to engage in a program designed to prevent body image and eating disturbances (Stice & Shaw, 2004). Younger adolescents also may have limited insight because their reasoning skills are still developing, which may prevent them from fully experiencing and benefiting from the intervention program (Stice & Shaw, 2004). Thus, an intervention aimed toward college women between the ages of 18 and 22 years may be more likely to produce positive effects as this time period corresponds to a specific developmental period when disordered eating pathology has been shown to significantly increase and when an individual may be developmentally capable of learning, understanding, and benefiting from potential intervention effects.

Number of Sessions

Researchers have concluded that brief single-session eating disorder interventions, which are usually 1 hour in length, do not induce long-lasting behavioral or attitudinal changes (Martz & Bazzini, 1999). For example, a meta-analysis of substance abuse prevention programs similarly indicated that multi-session interventions spread out over a longer period of time produced greater effects than brief, single-session interventions (Rooney & Murray, 1996). Furthermore, multi-session interventions, lasting at least 3 hours and occurring on a weekly basis, allow participants to reflect on and internalize the intervention material between the sessions. Stice and Shaw (2004) also have suggested that the multiple sessions (e.g., at least three sessions in length) give

participants a chance to try new skills and then return to their group for support and advice.

Program Content

Interventions focusing on specific risk factors for eating disorders will be more effective than those that focus on non-established risk factors (Stice et al., 2000). Specifically, programs that focus on increasing resistance to sociocultural pressures for thinness, body satisfaction, self-esteem, and healthy weight management skills cause greater and more positive behavioral and attitudinal changes than those that consist of only psychoeducation or utilize variables that are not established eating disorder risk factors, such as stress and coping skills (Larimer & Crounce, 2002; Stice & Shaw, 2004).

In a meta-analysis of all eating disorder prevention and intervention programs, Stice and Shaw (2004) found that 53% of the interventions resulted in significant reductions in at least one established risk factor for eating pathology, such as body dissatisfaction. Additionally, most of the programs that produced intervention effects for eating pathology focused on reducing empirically established risk factors for eating pathology. Approximately 25% of the interventions resulted in significant reductions in actual eating disordered behaviors, such as bingeing and purging. Further, several interventions reduced eating behaviors while significantly reducing risk factors for eating pathology (i.e., reducing bulimic behaviors while increasing body satisfaction). This meta-analysis also suggested that intervention program content is less important in predicting intervention effects than are features of the participants studied and the

research design. Thus, aspects of intervention delivery (e.g., use of an interactive format versus a didactic format) or of the population targeted (e.g., high-risk versus including all individuals) may be more important than content. Interestingly, the content for the programs that produced positive intervention effects for eating pathology varied significantly, including programs that focused on promoting self-esteem, stress management skills, healthy weight-control behaviors, and critical analysis of the thin-ideal. This pattern of findings suggests that there may be multiple methods to successfully prevent eating pathology. Nevertheless, the programs that produced the most promising results appeared to target maladaptive attitudes, such as thin-ideal internalization or body dissatisfaction, and maladaptive behaviors, such as fasting or overeating (Stice & Shaw, 2004), all of which are risk factors in the development of eating disorders.

A Dissonance-Based Eating Disorder Prevention Program

Because past research has demonstrated that prevention programs are most effective when there is a targeted population and an integrative approach (not solely psychoeducational), Stice, Trost, and Chase (2003) developed an eating disorder program that considered alternative methods of inducing attitudinal and behavioral change. The program was based on cognitive-dissonance theory, that is, creating dissonance among the participants as the motivation for change.

Dissonance Theory

Dissonance theory states that the possession of inconsistent cognitions creates psychological discomfort, which motivates people to alter their cognitions to restore consistency (Brehm & Cohen, 1962; Festinger, 1957). Based on this idea, individuals who are told to act in a way contrary to previously held attitudes experience cognitive dissonance, which in turn leads them to alter their behaviors or attitudes to reduce the inconsistency (Leippe & Eisenstadt, 1994). The individuals must also believe the new “attitude” was taken on voluntarily, otherwise the inconsistent behavior can be attributed to the demands of the situation and no lasting attitudinal or behavioral changes will result.

Initially, there were two preliminary studies that examined the efficacy of a cognitive-dissonance based approach. In the first nonrandomized trial, 30 late adolescent females (modal age = 18 years) with elevated body dissatisfaction were assigned to a dissonance intervention or to a measurement-only control condition (Stice, Mazotti, Weibel, & Agras, 2000). The intervention resulted in a subsequent decrease in thin-ideal internalization, body dissatisfaction, dieting behaviors, negative affect, and bulimic symptoms relative to the waitlist control group from baseline to termination. Most of the changes remained at the 1-month follow-up. This was one of the first prevention interventions to successfully reduce bulimic pathology in a controlled trial using a cognitive-dissonance approach.

The second preliminary trial provided a more comprehensive test of the cognitive-dissonance approach by using random assignment to condition, a larger sample, and a

placebo control condition (Stice, Chase, Stormer, & Appel, 2001). This trial was conducted with 87 young-adult females with self-reported body image concerns (modal age = 19 years). Participants were assigned randomly to either the dissonance intervention or to a healthy weight placebo control condition. Participants randomly assigned to the dissonance intervention showed the expected decreases in thin-ideal internalization, body dissatisfaction, dieting, negative affect, and bulimic symptoms, with these effects persisting at 1-month follow-up.

In another study, Stice, Trost, & Chase (2003) examined a cognitive-dissonance and healthy weight intervention program using 148 females who ranged in age from 13 to 20 (mean age = 17.4 years). Overall, it was found that participants in both interventions reported decreased thin-ideal internalization, negative affect, and bulimic symptoms at termination and 1-, 3-, and 6-month follow-up relative to controls. These results provided evidence that both interventions (a cognitive-dissonance based approach and healthy weight management) effectively reduce bulimic pathology and risk factors for eating disturbances. Further, Matussek, Wendt, and Wiseman (2004) conducted an intervention study using college women between the ages of 18 and 23 years of age with body image concerns. The 89 participants were randomly assigned to a cognitive-dissonance based, healthy weight, or wait-list control group. Comparing baseline data with 4-week follow-up data, the cognitive-dissonance and healthy weight participants reported improvement in body image, thin-ideal internalization, and eating behaviors, providing evidence that both interventions effectively reduce risk factors for eating pathology.

Recently, Stice, Shaw, Burton, and Wade (2006) conducted an intervention trial with 481 adolescent girls (mean age = 17 years). The participants were randomly assigned to an eating disorder prevention program involving dissonance-inducing activities that reduce thin-ideal internalization, a prevention program promoting healthy weight management, and expressive writing control condition, or an assessment-only control condition. Dissonance participants showed significantly greater reductions in eating disorder risk factors and bulimic symptoms than healthy weight, expressive writing, and assessment-only participants, and healthy weight participants showed significantly greater reductions in risk factors and symptoms than expressive writing and assessment-only from pre-test to post-test. Although these effects faded over 6-month and 12-month follow-ups, dissonance and healthy weight participants showed significantly lower binge eating and obesity onset (as compared to the control and expressive writing participants) through 12-month follow-up, suggesting that both interventions have public health potential. The authors of this study suggested that it would be important for future research to determine ways that enhance the magnitude and duration of the intervention effects from these two prevention programs. Strategies such as integrating promising programs, drawing further on persuasion principles from social psychology, or expanding upon the current programs may enhance intervention effects.

A Dissonance-Based Eating Disorder Prevention Program with Student-Athletes

In light of these recommendations, Smith and Petrie (in press) tested Stice's intervention to determine their efficacy in reducing psychological risk factors among

body dissatisfied female athletes. Specifically, it was intended to determine if the female athletes who participated in the cognitive dissonance intervention versus those who underwent the healthy weight program or were in the non-intervention control group showed reductions in internalization of the thin ideal, body dissatisfaction, negative affect, bulimic symptoms, and dieting behaviors. Although previous research has shown that a cognitive-dissonance based intervention can reduce thin-ideal internalization, negative affect, dieting behaviors, body dissatisfaction, and eating disorder symptoms within the general female college student population (Matusek, Wendt, & Wiseman, 2004; Stice et al., 2003), such effects were not found among a specific subgroup of undergraduates, female student athletes. Due to the lack of findings, various recommendations were made to guide future intervention research within the at-risk female college population. First, it was encouraged to examine the potential effects of a longer intervention, such as one 6 to 8 sessions in length, because longer interventions would allow the participants to engage in more dissonance-inducing activities and discussions while also allowing enough time for the dissonance to be relieved and for subsequent changes in participant attitudes and behaviors associated with disordered eating to occur. Second, facilitator error may have played a role in the lack of program success. Thus, it is important for future facilitators to adequately practice and become familiarized with the intervention protocols. Third, unlike the prior study where participants were notified of the study through their head coaches, it may be helpful for women to “self-select” to participate in an intervention program (e.g., participation becomes entirely voluntary). Therefore, interested individuals would be less likely to

attribute their participation in the study to external rather than internal reasons, creating less potential for the development of consonant explanations.

Eating Disorder Prevention Programs with Female College Students

Previous research has shown that programs are most effective when they are interactive and target an at-risk population, therefore, the current study will use female college students and follow Stice's protocol in the delivery and organization of the eating disorder intervention. The series of verbal, written, and behavioral exercises encourage the participants to critique the thin-ideal, reducing the extent to which this ideal of beauty is subscribed and consequently, promote healthier eating attitudes and behaviors as well as enhance overall well being. In addition, because researchers have concluded that multi-session interventions that were spread over a longer period of time produced superior effects (Rooney & Murray, 1996), the current interventions were expanded from three sessions to six sessions each. This longer length allows participants more time to reflect on intervention material between sessions, maximizing internalization and knowledge. The six-week sessions also allow participants to try new skills and return to the group for emotional support, which has been shown to increase intervention effectiveness (Stice & Shaw, 2004).

In this study, a new intervention program was created, a combined dissonance/healthy weight, which applies important concepts from the existing cognitive-dissonance and healthy weight interventions. This combined program emerged from participant and facilitator feedback during the pilot study. This new program combines

discussion regarding sociocultural pressures to be thin and thin-internalization with concrete strategies for maintaining a healthy lifestyle, including nutrition and physical activity. All three interventions also have corresponding workbooks for the participants to use and follow as they attend the program sessions, which will hopefully decrease attrition, help encourage homework completion, and establish a framework for them to follow as the sessions progress.

In this study, I hypothesize that:

1. Female college students who participate in the cognitive-dissonance and combined dissonance/healthy weight program will experience significant decreases in thin-internalization, body dissatisfaction, dieting, negative affect, and eating disorder symptoms over six weeks of the intervention and, at the post test, will have scores that are significantly lower than the healthy weight and control groups.
2. Female college students who participate in the healthy weight intervention will experience greater reductions in thin-internalization, body dissatisfaction, dieting, negative affect, and disordered eating symptoms than participants in the wait-list control over the six-week intervention.
3. Female college students who participants in the healthy weight and combined dissonance/healthy weight program will significantly improve their health/nutrition knowledge over the 6-week intervention and, compared to the dissonance or wait-list control, will have significantly higher scores at the post test.
4. At the 3- and 6-month follow-up, the female college students who participated in the cognitive dissonance, combined dissonance/healthy weight, and healthy weight programs will continue to have greater reductions in thin-internalization, body dissatisfaction, dieting, negative affect, and disordered eating symptoms than participants in the wait-list control.

APPENDIX B
DEMOGRAPHIC QUESTIONNAIRE

Demographics

I. Background Information

1. Sex: ☐ Male ☐ Female
2. Age: _____
3. Current Academic Status: ☐ Freshman ☐ Sophomore ☐ Junior ☐ Senior ☐ 5th Year
4. Race/Ethnicity: ☐ Caucasian/White ☐ Hispanic/Latino/Mexican American
☐ African-American/Black ☐ American Indian
☐ Asian American/Pacific Islander ☐ Other
(specify: _____)

II. Sport History

1. Did you play a sport in High School? ☐ Yes ☐ No
If Yes, what sport _____
If Yes, how many years did you participate: _____
2. Do you currently play a sport in college? ☐ Yes ☐ No
If Yes, what sport _____
If Yes, at what level (e.g., recreational, varsity, club)

III. Weight History

1. Present height: _____ feet _____ inches
2. Present weight: _____ pounds
a. Length of time at current weight: _____ (months)
3. Ideal weight: _____ pounds
4. My body frame is: ☐ Small ☐ Medium ☐ Large
5. Are you satisfied with your current weight? ☐ Yes ☐ No
a. If NO, do you consider yourself to be: ☐ overweight ☐ underweight
- 6a. Lowest weight in past 2 years: _____ 6b. Highest weight in past 2 years: _____

7. Have you ever been diagnosed or treated for:

Anorexia Nervosa? _____ Yes _____ No (If YES, indicate when _____)

Bulimia Nervosa? _____ Yes _____ No (If YES, indicate when _____)

Other Eating Disorder _____ Yes _____ No

(If YES, please indicate what disorder _____)

IV. Menstrual History

1. Have you ever had a menstrual period? _____ Yes _____ No

a. If YES, how old were you when you had your first menstrual period? _____

2. How many menstrual cycles have you had in the past 12 months? _____

3. On average, during the past 12 months, how many days have there been between your menstrual cycles? _____

4. On average, during the past 12 months, how many days do your periods (bleeding) last?

5. If you have taken hormone based birth control during the past 12 months, please indicate the effect it has had on your menstrual cycle.

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