

EFFECTIVENESS AND FEASIBILITY OF PEER-DELIVERED DISSONANCE-
BASED EATING DISORDER PREVENTION IN HIGH SCHOOL GIRLS

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Abstract

Objective: Dissonance-based eating disorder prevention programs utilize counterattitudinal exercises to challenge beliefs about the attainability of cultural beauty ideals. Research has demonstrated that dissonance-based prevention is effective in reducing eating disorder risk factors among adolescent and college-aged women. Programs can be delivered using professional providers (e.g., clinical psychologists) as well as endogenous providers (e.g., college-aged peer leaders, high school staff members). The aim of the current research was to investigate the feasibility of using younger peer leaders (i.e., high school girls) to deliver dissonance-based eating disorder prevention. **Method:** High school peer leaders across two studies ($N=20$) received 12 hours of training to deliver a manualized program to small groups of their peers. Study 1 ($N=23$) was a pilot trial to assess the feasibility and acceptability of the intervention. Study 2 ($N=50$) utilized a quasi-experimental, waitlist-controlled design to assess reductions in five established eating disorder risk factor outcomes: thin-ideal internalization, body dissatisfaction, eating pathology, dietary restraint, and negative affect. Half of participants received the intervention immediately and half participated after a two-week waitlist control period. All participants were assessed three months post-intervention. **Results:** Adherence to an age-adapted intervention manual was high in both studies. Feedback from participants across studies indicated the intervention was acceptable, enjoyable, and provided new information. Analysis of outcomes in Study 2 revealed significantly greater pre-post reductions in a majority of risk factors for those who received the intervention immediately compared to waitlist controls. Within-subject changes over time revealed significant pre-post reductions in a majority of risk factors

that were sustained through 3-month follow-up, except for thin-ideal internalization, which returned to baseline levels. Some discrepancies were found in measures assessing similar outcomes. **Discussion:** These two studies are the first to examine the feasibility of using high school peer leaders to implement an empirically-supported, dissonance-based eating disorder prevention program. Results provide tentative support for using high school peer leaders to conduct this type of intervention. Limitations of the current research are discussed, and include a small sample size, short-term waitlist comparison, and brief follow-up period. Future research is needed to replicate these findings in larger, randomized trials.

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Effectiveness and feasibility of peer-delivered dissonance-based eating disorder prevention in high school girls

Eating disorders such as bulimia nervosa, anorexia nervosa, and binge eating disorder are a significant problem among young women, marked by impairment, distress, psychological comorbidity, chronicity, medical consequences, and increased mortality (Herzog, et al., 2000; Lewinsohn, Striegel-Moore, & Seeley, 2000). Recent studies estimate that up to 12% of adolescent girls suffer from sub-threshold or full syndrome eating disorders (Stice, Marti, Shaw, & Jaconis, 2009). Those who suffer from sub-threshold eating disturbances experience impairment and distress similar to those with full syndrome eating disorders (Stice et al., 2009; Lewinsohn et al., 2000). While evidence-based treatments have been identified for bulimia nervosa and binge eating disorder, many patients do not receive these treatments (Wilson, 2005). In addition, there is a lack of evidence on the best ways to treat anorexia nervosa, due to both the low rates of the disorder and difficulty recruiting and retaining participants in treatment (Wilson, 2005; Vitousek, Watson, & Wilson, 1998). Given the serious consequences of eating disorders and the lack of success in treating many individuals with these problems, prevention of eating disturbances is an important priority. A peak period for risk of onset of eating disorders is mid- to late adolescence (Stice et al., 2009), and prevention efforts typically focus on this time period.

Over time, many types of eating disorder prevention programs have been evaluated. Early prevention programs consisted mostly of psychoeducational content, providing information to increase knowledge of eating disorders and their negative effects. In 2000, a National Institutes of Mental Health roundtable meeting on the state

of eating disorder prevention concluded that most existing programs produced little behavioral change, especially over the long-term. Further, some programs worsened eating disorder risk factors (Pearson, Goldklang, & Striegel-Moore, 2002). As research in this area progressed, programs ceased using psychoeducation alone and focused on incorporating methods to target empirically identified risk factors for developing eating disturbances. Although risk factors for developing specific eating disorders are unknown, risk factors for developing global eating pathology have been well-researched. A review of multiple prospective studies identified several factors that increase risk of eating disturbance: perceived pressure to be thin that comes from family, peers, or media, belief in the cultural thin-ideal, dissatisfaction with one's body, engaging in dieting behaviors, and negative affect (Stice, Ng, & Shaw, 2010). Currently, there is considerable support for eating disorder prevention programs that focus directly on reducing risk factors such as belief in the cultural thin-ideal, dissatisfaction with one's body, and negative affect.

A meta-analytic review evaluated randomized-controlled prevention programs focused on reducing one or more of five eating disorder risk factors: belief in the cultural thin-ideal (called "thin-ideal internalization"), body dissatisfaction, eating pathology, dietary restraint, and negative affect (Stice, Shaw, & Marti, 2007). Results indicated that about half of programs reduced eating disorder risk factors and almost a third reduced current or future eating disturbances. Average effect sizes for each risk factor at post-intervention and follow-up were small but significant across programs, and significant effect sizes of individual trials ranged from zero to quite large. Moderator analyses showed larger effect sizes with certain participant features, program features, and

program content. Participant features associated with larger effect sizes included greater age (over 15 years), high-risk status (where selective programs target individuals with elevated risk such as high body image concerns versus universal programs that target individuals of all risk levels), and female gender (with greater effects for programs targeting women only than both genders combined). Program features associated with larger effect sizes included the presence of interactive content (compared to psychoeducational or didactic content), intervention delivery over multiple sessions (versus in a single-session format) and intervention delivery by professional interventionists (versus endogenous providers such as school staff). Program content associated with larger effect sizes included cognitive dissonance content designed to reduce thin-ideal internalization and focusing on body acceptance. In contrast, programs with primarily psychoeducational content as well as those that focused on stress and coping were associated with smaller effect sizes. Stice and colleagues (2007) concluded that the state of eating disorder prevention has changed. Specifically, there is sufficient evidence for several programs that successfully reduce risk for eating pathology over the long term, and research continues on what may lead to larger or smaller effects within these programs. The authors suggest that researchers build on this knowledge to create more sophisticated prevention interventions over the long-term.

Dissonance-Based Eating Disorder Prevention

Although the current state of eating disorder prevention research is encouraging, much of the research on programs that are effective comes from single research labs (Shaw, Stice & Becker, 2009). Only two prevention interventions have been independently studied by different labs: *dissonance-based interventions* and *healthy*

weight interventions. Dissonance-based interventions have been evaluated by six independent labs; therefore, they are one of the leading efficacious eating disorder prevention programs to date. Dissonance-based programs meet American Psychological Association criteria for an efficacious intervention, outperforming a no-treatment control, a placebo group, and alternative interventions (Shaw et al., 2009).

Dissonance-based interventions utilize the social psychology theory of cognitive dissonance (Festinger, 1957). Cognitive dissonance theory is based upon the assumption that an inconsistency or discrepancy among an individual's beliefs, attitudes, or actions will cause psychological discomfort. An individual will attempt to resolve this discomfort and to maintain consistency among their views by changing their attitudes, beliefs, or behaviors so they are perceived as consistent. The degree of dissonance experienced depends on the importance of the issue raised and the degree of inconsistency between the belief, attitude, or action. It is most common that individuals will change their attitudes to accommodate their behavior (Festinger, 1957).

A dissonance-based intervention called the *Body Project* was developed by Eric Stice and colleagues at the University of Texas, in response to the limited success of eating disorder prevention programs at that time (Stice, Mazotti, Weibel, & Agras, 2000). Stice and colleagues observed that dissonance interventions had proven successful in creating attitudinal change in areas outside of eating disorders and had also been utilized in treatment for anorexia nervosa. They developed the intervention to target one specific eating disorder risk factor: thin-ideal internalization. The program used verbal, written, and behavioral exercises to encourage young women to challenge their belief in the very thin cultural beauty ideal. Exercises were designed so participants repeatedly made

statements and engaged in behaviors that are inconsistent with the thin-ideal. The group intervention was purposefully interactive (minimizing passive or didactic content) and included individual activities like self-affirmation exercises and writing assignments as well as group activities like role-plays and behavioral challenges. Homework activities were assigned between sessions to extend dissonance activities into everyday life (Stice et al., 2000).

Based on cognitive dissonance theory, it is assumed that counterattitudinal exercises such as those in the *Body Project* will create dissonance between old pro-thin attitudes and behaviors and new anti-thin attitudes and behaviors. As a result, individuals will attempt to resolve this psychological discomfort by shifting toward new, healthier attitudes about weight (Stice et al., 2000). According to Stice's dual pathway model of bulimia nervosa (Stice, 1994), dissonance-based programs that focus on reducing thin-ideal internalization will affect additional eating disorder risk factors. This model posits that thin-ideal internalization, perceived pressures to be thin, and elevated body mass will lead to body dissatisfaction. Body dissatisfaction will, in turn, lead to dieting and negative affect, increasing the risk for binge eating and the onset of bulimia nervosa. Therefore, an intervention that reduces one of the factors in the initial levels of the model (e.g., thin-ideal internalization) will cause subsequent reductions in factors further down the line and ultimately reduce the likelihood of onset of bulimic symptoms.

Efficacy and Effectiveness of Dissonance-Based Interventions

Six independent research labs have conducted trials to evaluate dissonance interventions based on Stice's original intervention. Trials fall into one of two categories: efficacy studies and effectiveness studies. The majority of trials are classified as efficacy

studies, which utilize professional interventionists to deliver the intervention (e.g., doctoral-level psychologists, graduate students, or highly trained undergraduate students) and are conducted using rigorous experimental methodology (e.g., randomized-controlled designs, homogenous participants). In addition, several effectiveness trials have examined dissonance-based interventions when delivered in naturalistic settings. These studies use endogenous providers to deliver the intervention (e.g., peer leaders and school staff members), and experimental methodology is not as tightly controlled (e.g., participants are often heterogeneous and certain methodological components, such as close adherence to protocols, are not guaranteed). The evidence base for efficacy and effectiveness trials of dissonance-based programs is summarized separately below. Most trials focus on intervention effects on one or more of five eating disorder risk factors: thin-ideal internalization, body dissatisfaction, eating pathology (sometimes also called bulimic symptoms), dieting/dietary restraint, and negative affect.

Efficacy trials. The first dissonance-based intervention trial was conducted by Stice and colleagues to examine the feasibility of their newly-developed intervention (Stice et al., 2000). Three 1-hour group sessions were led by professionals and were spaced over three weeks. Participants were high-risk adolescent girls with high body image concerns. Compared to a waitlist control group, dissonance participants showed post-intervention improvement in thin-ideal internalization, body dissatisfaction, negative affect, and bulimic symptoms. These effects, with the exception of negative affect, persisted at 1-month follow-up.

This study was followed by a larger, randomized replication trial, comparing dissonance to an active control condition focusing on healthy weight control (Stice,

Chase, Stormer, & Appel, 2001). The healthy weight intervention provided information on nutrition and exercise and individualized plans to change these aspects of participants' lives. Participants were high-risk adolescent girls with high body image concerns. Participants who received the dissonance-based intervention showed reductions in thin-ideal internalization, body dissatisfaction, dieting, negative affect, and bulimic symptoms from baseline to post-intervention and at 1-month follow-up. Compared to participants in the healthy weight intervention, participants in the dissonance-based program had greater reductions in thin-ideal internalization and body dissatisfaction; yet no significant differences existed on other outcomes.

A third trial was conducted to explore the unexpected positive effects of the healthy weight intervention (Stice, Trost, & Chase, 2003). This study compared the dissonance-based intervention to both the healthy weight intervention and a waitlist control. Participants were high-risk adolescent girls. Participants in both active interventions reported reductions in negative affect and bulimic symptoms at post-intervention and follow-ups compared to waitlist controls. No effects were found for other outcomes compared to controls. When dissonance and healthy weight interventions were compared directly, participants in the dissonance-based intervention experienced greater reductions in thin-ideal internalization, body dissatisfaction, negative affect, and bulimic symptoms at post-intervention; these effects were maintained at follow-up for thin-ideal internalization and body dissatisfaction.

Following this trial, the healthy weight intervention was enhanced with the addition of behavioral weight control techniques and motivational principles. A large-scale trial compared the enhanced healthy weight intervention and dissonance-based

intervention to an expressive writing control and an assessment-only control (Stice, Shaw, Burton, & Wade, 2006; Stice, Marti, Spoor, Presnell, & Shaw, 2008). Participants were high risk adolescent girls, and long-term follow-ups of six months, one, two, and three years were completed. Compared to assessment-only control, participants in the dissonance-based intervention showed greater reductions in thin-ideal internalization, body dissatisfaction, dieting, negative affect, and bulimic symptoms at post-intervention and 6-month follow-up, and reductions in thin-ideal internalization, dieting, and bulimic symptoms at 1-year follow-up. Compared to expressive writing control, participants in the dissonance-based intervention showed greater reductions in thin-ideal internalization, body dissatisfaction, dieting, negative affect, and bulimic symptoms at post-intervention, reductions in body dissatisfaction, dieting, negative affect, and bulimic symptoms at 6-month follow-up, and reductions in dieting at 1-year follow-up. Dissonance participants, when compared directly to healthy weight participants, showed greater reductions in thin-ideal internalization, body dissatisfaction, dieting, negative affect, and bulimic symptoms at post-intervention, along with reductions in negative affect at 6-month and 1-year follow-up. Risk of future onset of obesity in the 1-year follow-up was lower for both active interventions (Stice et al., 2006).

At the 2- and 3-year follow-up of the same trial (Stice et al., 2008), participants in the dissonance intervention continued to show reductions in eating disorder risk factors compared to control conditions, as well as a lowered risk of future onset of eating disorders (threshold and subthreshold) by 60% compared to controls through a 3-year follow-up. Participants in the healthy weight intervention also experienced reductions in eating disorder risk factors compared to control conditions, and in addition, a reduced

risk of future onset of obesity at long-term follow-up. The authors concluded that dissonance and healthy weight interventions were both effective at reducing eating disorder risk in the long term, although the dissonance-based intervention appeared to be slightly better at reducing risk of future onset of eating disorders while healthy weight was more successful at reducing risk of future onset of obesity.

Becker and colleagues modified Stice's original intervention for use with college-aged women in sororities. Intervention content was similar but combined counterattitudinal exercises into two 2-hour sessions (Becker, Jilka, & Polvere, 2002). A passive comparison intervention was developed. This passive media advocacy intervention was similar to the dissonance-based intervention, but specific dissonance activities (e.g., role plays) were removed and replaced with videos that explored the role of the media in eating disorders development. Groups were professionally led and sessions were held one week apart. A small pilot study targeted sorority members with high body image concerns and found that both interventions reduced dieting, eating pathology, and body dissatisfaction at 1-month follow-up. Participants who received the dissonance-based intervention reduced thin-ideal internalization and produced greater reductions in body dissatisfaction compared to the media advocacy intervention.

Participant feedback after the pilot study indicated a preference to offer the program to all sorority members, not only those identified as high risk. A second trial by Becker and colleagues expanded the pilot study to compare the dissonance and media advocacy interventions to a waitlist control (Becker, Smith, & Ciao, 2005). Members of all sororities, regardless of risk status, were invited to participate in the *Sorority Body Image Program*. Results indicated that overall, the dissonance-based intervention

performed similarly to the media advocacy intervention. Both interventions reduced dieting, body dissatisfaction, and eating pathology at 1-month follow-up compared to controls, but only participants in the dissonance intervention revealed greater reductions in thin-ideal internalization compared to controls. Low- and high-risk participants responded similarly to each intervention.

Based on additional feedback from sorority members, subsequent prevention trials by Becker and colleagues involved changes to the delivery method of the *Sorority Body Image Program*. Specifically, sororities indicated a preference to have the program delivered to all new sorority members at the time they joined the organization. This request required a transition from professional delivery, where only one group could be conducted at a time, to a system where many groups could be conducted simultaneously. Peer-led prevention was initiated, in which older sorority leaders learned to deliver the program to younger members. Due to the change in delivery method, where the program became integrated into the community and waitlist control was no longer possible, these peer-led trials are considered effectiveness trials and are reviewed in the “Effectiveness trials” section below.

Three other independent labs, plus an additional study from Stice’s group, add to the evidence base for dissonance-based efficacy studies. A study by Mitchell and colleagues (2007) compared a six-session dissonance-based intervention with a yoga group or assessment-only control among college-aged women with high body image concerns. The dissonance intervention produced superior reductions in eating disorder symptoms and body dissatisfaction compared to the yoga and assessment control groups (Mitchell, Mazzeo, Rausch, & Cooke, 2007). Three additional studies examined the

specific effect of the dissonance content in dissonance-based interventions. In a dismantling investigation (Roehrig, Thompson, Brannick, & van den Berg, 2006), college-aged women with high thin-ideal internalization and body dissatisfaction received the full dissonance-based intervention (including other psychoeducational or behavioral materials) or an intervention containing only dissonance activities. Results indicated equal reductions in body dissatisfaction, dieting, and bulimic symptoms across both interventions. In a study that manipulated level of dissonance, Green and colleagues (2005) compared high- and low-dissonance interventions to a no-treatment control among college-aged women. The high-dissonance intervention involved a high level of effort, publicly stated attitudes, and voluntary participation, whereas the low-dissonance intervention involved a low level of effort, privately stated attitudes, and less voluntary participation. Both interventions were delivered by professionals in two 2-hour sessions and participants were included regardless of risk status. High-dissonance intervention participants displayed lower eating disorder attitudes post-intervention compared to low-dissonance intervention participants, although neither active group differed from controls (Green, Scott, Diyanikova, & Gasser, 2005). A similar study by Stice's group compared high- and low-dissonance interventions to a waitlist control among high-risk college-aged women (McMillan, Stice, & Rhode, 2011). The high-dissonance condition was designed to provide maximum dissonance during the intervention, and the low-dissonance condition was designed to minimize active dissonance components. Interventions were delivered by professionals in four 1-hour sessions. Compared to controls, high-dissonance intervention participants revealed reductions in thin-ideal internalization, body dissatisfaction, dieting, and eating pathology following the intervention. Effects

remained at three month follow-up, with the exception of eating pathology. Low-dissonance intervention participants demonstrated reductions in thin-ideal internalization, body dissatisfaction, and dieting compared to controls; effects remained at follow-up with the exception of body dissatisfaction. When high- and low-dissonance programs were compared directly, high-dissonance participants experienced greater reductions in eating disorder pathology at post-intervention, but this difference disappeared at follow-up. Taken together, results from these studies indicate that while dissonance components are important contributors to intervention effects, other factors are also potent in contributing to effects.

The consistency of results from these 11 studies from five independent labs establishes the efficacy for dissonance-based programs in preventing eating disturbances among adolescent girls (Stice et al., 2000, 2001, 2003, 2006, 2008) and college-aged women (Becker et al., 2002, 2005; Green et al., 2005; McMillan et al., 2011; Mitchell et al., 2007; Roehrig et al., 2006). Most studies focused on providing selected prevention to high-risk women, which converges with recommendations from Stice and colleagues that larger effect sizes are found in programs that focus on high-risk individuals (Stice et al., 2007). Two studies, however, established the success of universal prevention, where women of all risk levels received the intervention (Becker et al., 2005; Green et al., 2005). Both universal prevention trials conducted analyses to compare effects of the intervention on high- and low-risk participants, and found the interventions worked similarly regardless of risk status. Therefore, dissonance-based interventions that focus on inclusion of participants of all risk levels appear warranted.

Effectiveness trials. The labs of Stice and Becker along with an additional independent lab have undertaken effectiveness trials of dissonance-based interventions. It is essential for effectiveness research to take place in order to explore whether evidence-based programs can be disseminated to communities. One substantial benefit of the effectiveness trials conducted with dissonance-based programs is that they use endogenous providers to deliver interventions, which can allow programs to become sustainable over time within established communities and social systems. Further, these effectiveness trials often include less control over research conditions, allowing an evaluation of whether programs are still effective when delivered in the “real world.”

Matusek and colleagues (2004) conducted one of the early effectiveness trials on dissonance-based prevention. College health educators were trained to administer one session of either a dissonance or a healthy weight intervention. Female college-aged women with high body image concerns received one of the interventions or were placed on a waitlist control. Dissonance and healthy weight interventions both reduced thin-ideal internalization and eating pathology compared to controls. No differences were found for either intervention group compared to controls in body dissatisfaction or negative affect, and there were no differences between the two active interventions (Matusek, Wendt, & Wiseman, 2004).

Stice and colleagues recently conducted a large effectiveness trial of their dissonance-based intervention (Stice, Rohde, Gau, & Shaw, 2009) that includes a three-year follow-up (Stice, Rhode, Shaw, & Gau, 2011). Across three school districts, high school staff members (including nurses, counselors, and teachers) completed four hours of training and were responsible for recruiting participants and delivering the dissonance

program within schools. The 3-session intervention was expanded to four shorter sessions. Participants were adolescent girls with self-reported high body image concerns. Results indicated that, compared to a psychoeducational brochure control condition, participants in the dissonance-based intervention experienced reductions in key eating disorder risk factors at two-year follow-up. At the 3 year follow-up of the same trial (Stice et al., 2011), participants in the dissonance-based intervention demonstrated reductions in eating disorders symptoms compared to controls. Effects for other risk factors and risk for onset of eating disorders compared to controls were small or insignificant at the long-term follow-up. Effect sizes were smaller than in the professionally-delivered trials Stice had completed previously. The authors concluded that dissonance-based interventions can be delivered successfully using endogenous providers in a high school setting.

As mentioned above, Becker and colleagues have completed several trials using endogenous providers to deliver dissonance-based interventions. In the first trial, the *Sorority Body Image Program* was modified after feedback from sorority leaders required Becker and colleagues to develop a way of delivering the program to multiple, simultaneous groups (Becker, Smith, & Ciao, 2006). Peer leaders who had participated in one of the earlier intervention trials received nine additional hours of supervised training on how to deliver either the dissonance or media advocacy intervention to groups of their peers. Participants were new sorority members, and the program was implemented on a semi-mandatory basis. Results indicated that peer leaders could successfully administer both interventions. Changes in outcomes were similar to the original program, where both interventions reduced eating disorder risk factors at post-

intervention and at short-term follow-up. Further, the dissonance-based intervention provided greater reductions in thin-ideal internalization, body dissatisfaction, and dieting compared to the media advocacy intervention at 8-month follow-up. Participants in both interventions experienced reductions in bulimic pathology at 8-month follow-up. In addition, the experience of being a peer leader was beneficial in and of itself; peer leaders experienced improvements in eating disorder risk factors above and beyond participating in the intervention groups (Becker, Bull, Smith & Ciao, 2008).

A replication trial provides further support for peer-led prevention in this population (Becker, Bull, Schaumberg, Cauble, & Franco, 2008). Peer-delivered dissonance and media advocacy interventions reduced thin-ideal internalization, body dissatisfaction, dietary restraint, and bulimic pathology among participants over an 8-month follow-up. Further, an examination of risk status within participants indicated that only the dissonance-based intervention was beneficial to lower-risk participants, whereas both interventions were beneficial to high-risk participants. In an extension of this research, and in order to investigate other potentially effective interventions for this population, Becker and colleagues adapted the healthy weight intervention used by Stice and colleagues (Stice et al., 2003, 2006, 2008) to be delivered by peer leaders in the college setting. The two-session dissonance and healthy weight interventions were both delivered by peer-leaders in a female sorority population of all risk levels. Results demonstrated the relative superiority of the dissonance intervention in this population, although both interventions produced positive effects through a 14-month follow-up (Becker, Wilson, Williams, Kelly, McDaniel, & Elmquist, 2010). The results from this series of studies demonstrate the overall success of peer-delivered dissonance prevention

among college-aged women of all risk levels. In 2005 the Delta Delta Delta Fraternity adopted the peer-led dissonance intervention from the *Sorority Body Image Program*. The dissonance-based intervention is currently being implemented nationwide in these and other sorority settings. A study on the outcomes of this dissemination in national sororities indicates that the program can be effectively delivered on a wide scale under naturalistic conditions (Perez, Becker, & Ramierz, 2010). An additional extension of peer-delivered prevention examined the success of the dissonance and healthy weight programs among college athletes (Becker, McDaniel, Bull, Powell, & McIntyre, 2012). Female college athletes of all risk levels received a 3-session, peer-led dissonance or health weight intervention. Results demonstrate that both interventions reduced eating disorder risk factors through 1-year follow-up, but qualitative evaluation suggested the healthy weight intervention may be preferable for use with an athlete population.

Taken together, these independent research trials demonstrate that dissonance-based interventions can be successfully implemented using a variety of endogenous providers (college health educators, high school nurses, coaches, and teachers, and college-aged peer leaders) among adolescent girls (Stice et al., 2009, 2011) and college-aged women (Matusek et al., 2004, Becker et al., 2006, 2008, 2010, 2012; Perez et al., 2010). In addition, the work of Becker and colleagues (2006, 2008, 2010, 2012; Perez et al., 2010) provides a rich evidence base for using the peer-delivery model to create sustainable dissonance programs within communities. Their research also provides support that dissonance-based interventions delivered universally can produce similar results for high- and low-risk participants. This is important since universal delivery may

be the preference of social systems that wish to implement programs on a large scale or do not wish to target only high-risk individuals for prevention.

The Current Research

The aim of the current research was to fill an important gap in the evidence base for dissonance-based prevention delivered through endogenous providers. Specifically, the goal was to investigate the feasibility and effectiveness of peer-led dissonance prevention with a novel population: younger adolescents. Given that mid- to late-adolescence is a high risk period for developing eating disorders (Stice et al., 2009), prevention efforts that focus on this age group and younger are essential. Through two studies, (a) a initial pilot trial of effectiveness and feasibility and (b) a quasi-experimental, waitlist-controlled study, the current research was designed to extend the previous peer-led work of Becker and colleagues (2006, 2008, 2010, 2012; Perez et al., 2010). Both studies were conducted within the same high school in Hawaii. In order to compare the current research to previous studies, the intervention was closely modeled after the peer-delivered program used in Becker's *Sorority Body Image Program*. The goals of Study 1 were to develop an age-appropriate peer leader manual was and to initially evaluate the dissonance-based intervention with a self-selected group of high school girls. Based on feedback from participants and school staff members, as well as initial positive results from Study 1, in Study 2 the program was expanded and evaluated when delivered on a mandatory basis through the freshman health curriculum in the high school.

The methods for Study 1 and Study 2 are nearly identical. Intervention content and the selection and training of peer leaders were the same across studies. Yet Study 1

and 2 are presented separately here, in order to describe the progression of the research program and highlight key differences in implementation. One notable difference between studies is the nature of participation. In Study 1, group members participated voluntarily, whereas in Study 2, participation was mandatory, as the program was delivered and data were collected as part of the school curriculum. A second difference was participant age. In Study 1, participants were 10th-12th graders, based on previous research that prevention programs produce larger effects with girls age 15 and older (Stice et al., 2007). In Study 2, the participating high school requested program implementation within freshman health classes, and so participants were all 9th graders. Finally, while the risk factors identified as primary outcomes in Study 1 and Study 2 were the same (with one exception), differences exist between studies in the specific measures selected to assess each construct.

Partnership with high school. Both studies were conducted at Hawaii Preparatory Academy (HPA), a private, coed, K-12 partial boarding school located in Waimea, Hawaii Island. HPA was selected as the participating school because of an ongoing relationship between the University of Hawaii and HPA and because the school expressed interest in receiving an eating disorder prevention program for their students. In addition, research suggests that private boarding school students have a higher rate of eating disorder symptoms than public school students (Lesar, Arnou, Stice, & Agras, 2001). HPA high school includes about 350 students, or roughly 90 students per grade. HPA committed to bringing the program to their high school campus in 2011 and offered full support of the intervention and its corresponding research activities. HPA was enthusiastic about delivering the intervention using a peer-led model, for ease of

dissemination and to add leadership opportunities for their students. The project was called the “HPA Body Image Project.”

This research with HPA was viewed as a collaboration focused on the goals of community-partnership research. Becker and colleagues outline the application of community-partnership research with dissonance-based interventions, which requires involving the members of a community in designing and implementing research (Becker, Stice, Shaw, & Woda, 2009). The authors describe the benefits and challenges to working with communities within this model, and emphasize that community-partnership research improves the dissemination and sustainability of empirically-supported interventions. The current research was focused on working closely with HPA to make collaborative decisions about the research design to create a program that was both evidence-based and acceptable to the school community, and therefore, sustainable over the long-term. As such, decisions about study methodology and implementation were made in close consultation with HPA administration and several key staff members. Every effort was made to meet the wishes of the school while maintaining a research project with methodology that would allow specific hypothesis testing to assess the viability and effectiveness of the program within the high school setting. Presentations at school staff meetings and regular consultation with staff members helped to inform and guide the implementation process.

Two specific examples help to illustrate this collaborative process. First, when the project was initially proposed to HPA, the administration did not favor the use of a traditional control group, where some students would not receive any intervention. Therefore, a waitlist control was utilized in order to provide the intervention to all

students involved with the project. Further, although the originally proposed design included random allocation to condition and a waitlist control group that included two waitlist assessments at post-intervention and 1-month follow-up, HPA believed it might seem unfair to make some students, in particular those who attended classes together or lived in dorms together, to wait this length of time to participate compared to their peers. HPA suggested that the program would fit with the school schedule and be more practical for their students with a short waitlist period, and with allocation to groups based on student convenience and schedule. Given this preference, both studies utilized a quasi-experimental design to include an active group that received the intervention immediately, and a waitlist group that received a waitlist assessment and the intervention two weeks later. Participants were assigned to active or waitlist groups based on factors such as school schedule and the academic calendar. Since one of the major goals of the research was to perform an initial evaluation of the effectiveness of the peer-led dissonance-based program over time, all students involved with the program were assessed at all time points during the length of the program and through a follow-up period. This meant that unlike traditional waitlist control designs, where waitlist participants are not monitored after their involvement as controls, everyone was assessed, including waitlist group members, from post-intervention through follow-up.

A second example of the collaboration with the school occurred with changes in implementation during Study 2. Formal and informal feedback from peer leaders and group members who participated in Study 1 and from school staff and administration who participated in research planning highlighted the desire for program implementation on a wider basis within the school. Since initial results from the implementation

suggested that the program had a quantifiable positive benefit, consultation with HPA was focused on determining the most effective route to deliver the intervention on a wider scale. It was decided that implementation through freshman health classes, a required course for all HPA 9th grade students, would be practical and sustainable. In particular, one specific health teacher was enthusiastic about the research and intervention content and was willing to allocate classroom time to the project. Although delivery using this avenue changed the nature of the project, utilizing a mandatory format and moving to a younger population, it was still in line with the overall research goal of evaluating the feasibility of the peer-led intervention within the high school setting. Within this implementation format, the school took on responsibility for all aspects of the research project, including data collection. Feedback from Study 1 also indicated a request to shorten the length of surveys used in assessment. In order to help streamline the assessment process for the school, a new survey packet was created for Study 2 that was significantly shorter and took less time to complete.

Hypotheses. Both Study 1 and Study 2 were designed to address the research question of whether eating disorder risk factors could be affected by participation in a dissonance-based program delivered using trained high school peer leaders. Within this were three specific hypotheses. First, it was hypothesized that high school peer leaders could be trained to effectively deliver a dissonance-based intervention. Specifically, it was predicted that in both studies, peer leaders would deliver the intervention with a high level of adherence to a manual created for this population. Second, it was hypothesized that the intervention would be viewed positively by peer leaders and participants. A third hypothesis was that the intervention would result in improvements in all eating disorder

risk factors. Specifically, it was predicted that improvements would be present following participation in the program compared to the waitlist control group, and that all participants would experience improvements in risk factors over time, as measured through post-intervention and follow-up assessments. Additionally, while a formal evaluation of school staff and administration on the acceptability of the program was not conducted, it was hypothesized that qualitative feedback from key stakeholders within the school would find the implementation acceptable and sustainable within the high school community.

Study 1 Method

Study 1 was implemented in the Spring of 2011. The purpose of Study 1 was to perform an initial evaluation of the dissonance-based intervention to examine the feasibility, acceptability, and effectiveness of peer-delivered eating disorders prevention at HPA.

Participants

Peer leaders for Study 1 were 10 junior and senior girls recruited through the school counselor. These peer leaders formed three teams. Each peer leader team led one group during the semester. Peer leader selection, recruitment, and training are described below.

Group members for Study 1 were 27 high school sophomore, juniors, and seniors recruited through fliers and recruitment talks on the school campus. Participant age ranged from 14-19, Mean (SD) = 16.08 (1.31) years. The majority were high school sophomores (61%), and the remainder were juniors (9%) or seniors (30%). Baseline BMI ranged from 17.97 to 36.49, Mean (SD) = 23.17 (5.47). Group members were

primarily Caucasian (44%), Asian (22%), Other/Mixed (21%), or Hawaiian or Pacific Islander (13%). The majority (78%) were born in the United States and approximately half (44%) were day students, with the other half living as boarding students at the high school.

Procedure

Overview of study. Intervention sessions were conducted outside of school hours on the high school campus. Group allocation was determined based on scheduling feasibility. At the suggestion of HPA, groups were scheduled on weekday evenings (easier for day students to attend before driving home for the evening) and on weekend days (easier for boarding students to attend). Peer leader availability for running groups was also accommodated. At the request of the participating high school, all day students ($n = 12$) were allocated to receive the intervention right away as active group members, and all boarding students ($n = 15$) were allocated to the waitlist control group to receive the intervention two weeks later. The intervention consisted of two sessions, each lasting approximately 1.5 hours. Active and waitlist groups received the same intervention delivered by different peer leader teams. Active group members were split into two separate groups, consisting of six members and three or four peer leaders. Session 1 and Session 2 were held nine days apart for the active groups. Due to scheduling difficulties, the waitlist group participated in one larger group, consisting of 15 members and three peer leaders. Session 1 and Session 2 were held one week apart for the waitlist group.

Active group members were asked to fill out surveys immediately before Session 1 (baseline). Waitlist group members completed a baseline assessment on the same day active group members began the intervention, and then completed a second

baseline/waitlist assessment before they participated in Session 1 two weeks later. All group members (active and waitlist) were asked to complete surveys after they completed Session 2 (post-intervention). Research staff administered baseline surveys, and peer leaders collected post-intervention surveys. One-to-two months following the program, all participants were contacted through email to complete a follow-up assessment online using SurveyMonkey.com. Participants were offered a \$5.00 Starbucks gift card in exchange for participating in the follow-up assessment. Although a waitlist comparison is not possible for the follow-up assessment, follow-up data was collected to assess the maintenance of changes in eating disorder risk factors over time. Follow-up assessments were completed an average of six weeks after Session 2 was completed, Mean (SD) = 6.81 (1.37) weeks. All procedures were approved by the University of Hawaii IRB and HPA.

Peer leader recruitment, selection, and training. Fifteen girls from the high school junior and senior class attended an informational meeting to learn about becoming peer leaders. Criteria for peer leaders included known leadership skills and a commitment to leading groups of their peers in activities to promote positive body image. Following the model outlined in Becker and Stice's published manual for peer-led dissonance prevention, the *Sorority Body Image Program Group Leader Guide* (2008), potential peer leaders were told that they were expected to represent the message of the program. Specifically, while they were not asked to have excellent body image and no concerns whatsoever in the domains of eating and weight, it was made explicit that peer leaders should not have an active eating disorder or have severe enough body image concerns that they would be unable to conduct groups thoughtfully. Issues such as these

are usually well-known within the boarding school community and in addition to consulting with each potential peer leader on these issues and asking girls to self-select based on how they feel about these issues, the school counselor who recruited peer leaders was encouraged to not recommend girls for whom this was problematic. When asking girls to self-select, it was emphasized that there were many plausible reasons not to volunteer as a peer leader, such as the large time commitment required. This was done so as to avoid singling out girls who chose not to participate because of possible eating or weight concerns. In a more formal screening process, peer leaders who were still interested after the informational meeting were assessed for active eating disorders symptoms using the EDEQ (Fairburn & Beglin, 1994).

Twelve of the 15 peer leaders who attended the informational meeting signed up to become peer leaders, and none met diagnostic criteria for a probable eating disorder as measured with the EDEQ. All 12 (11 seniors, 1 junior) were invited to complete peer leader training, held over two days. One peer leader was ill and unable to attend either day of training. Another peer leader was able to complete only part of Day 1 of the training due to scheduling conflict, and decided to withdraw from participation altogether. The remaining 10 peer leaders (9 seniors, 1 junior) completed 12 hours of training over a two-day period. Three teams of peer leaders were formed during training (one group of four and two groups of three).

Three female graduate students in clinical psychology at the University of Hawaii (UH) conducted peer leader training. Two school counselors (also female) sat in on day 1 of training to become familiar with the intervention content. Day 1 of training focused on Session 1 of the intervention, and day 2 focused on Session 2. Each day began with a

demonstration of the session, with UH trainers serving as group leaders and trainees participating as group members. During the remainder of the training day, peer leader teams took turns leading the complete session using a detailed leader manual. When it was not their turn to lead, other peer leaders acted as group members. Following each practice round of a session, UH trainers provided detailed feedback to the peer leader team. Trainers first asked peer leaders what it was like to run the group, giving leaders a chance to voice concerns. Supervision feedback focused on ways to adhere to the leader manual as well as tactics for keeping to time limits for each section. General supervision about leading groups was also provided, and potential difficulties were anticipated and problem-solved. Approximately 30 minutes of feedback were provided to each peer leader team. Over the course of the 2-day training, peer leaders were exposed to the program a total of four times: once with the UH trainers, and one time with each team of peer leaders. For the sake of time, during training UH trainers moved peer leader teams more quickly through sessions than real-time, pretending the discussions had been carried out in full.

Peer leader supervision. The lead author was on-site at the high school campus while all groups were being conducted to assist with any unforeseen difficulties with implementation. Peer leaders were instructed to call if any such instances occurred, and none did. Peer leaders were asked to audio record all intervention sessions to provide supervision to peer leader teams and assess adherence. For purposes of supervision, the lead author reviewed the audio recording for Session 1 of each group. Between Session 1 and Session 2, peer leader teams were provided with brief (i.e., 15 minutes) feedback focused on group management and adhering to intervention content. All intervention

sessions were rated for adherence using detailed adherence checklists created by the lead author based on the peer leader manual. Appendix A includes Session 1 and 2 adherence checklists.

Dissonance-based intervention. A Peer Leader Guide was created specifically for HPA, adapted (with permission) from the *Sorority Body Image Program Group Leader Guide* (Becker & Stice, 2008). The guide was modified to include examples relevant to high school and language was changed to reflect the school culture at HPA. A section on cultural beauty ideals was added to capture the cultural and ethnic diversity that is typical of students at HPA. Throughout the manual, sections were color-coded to make following scripts easier. The manual was enhanced to include lists of materials needed for each session, reminders of directions and time limits for group leaders to follow for each section, and “fun facts” about dieting, exercise, and weight for peer leaders to share with group members. Group member worksheets were also modified to include language specific to the high school.

Session 1. In Session 1, participants are presented with an overview of the program and its history. The group then collectively describes the thin-ideal, discusses how it is maintained, and identifies who benefits from its existence. Next, group members complete a writing exercise that entails listing the costs of pursuing the thin-ideal. Each member shares her costs with the group, and a master list of costs is created. The group then discusses the degree to which the thin-ideal is attainable, taking costs into account. Group members discuss the time and effort needed to make celebrities appear ideal. The session ends with a homework counterattitudinal exercise. Everyone is instructed to, at some point in the following week, stand alone and in private in front of a

mirror wearing as little clothing as feels comfortable. While doing so, members are asked to note only positive attributes, including physical, emotional, and mental qualities. The group is told that they will be sharing their experience in the next session.

Session 2. Session 2 begins with sharing positive attributes individuals had noticed in the mirror exercise. Because in past groups, many members initially report personality attributes as opposed to physical ones, peer leaders are instructed to encourage everyone to share both a personality attribute and a physical attribute. Participants then are separated into subgroups of 3-4 people for a role-play exercise. In the role-play, peer leaders each adopt a role in which they act as fellow high schoolers who are heavily invested in pursuing the thin-ideal. The goal of the rest of the group is to convince each of the peer leaders to give up pursuit of the thin-ideal. One peer leader role-plays a student with anorexia nervosa, one a compulsive exerciser, and one an excessive and unhealthy dieter. After hearing a description of each leader's character, participants are divided into small subgroups and given 10 minutes to develop their strategy for each role-play. Each subgroup meets with each peer leader and completes three role-play exercises. The group comes back together and discusses participants' reactions during the role-plays. The group then completes a verbal challenge task, in which each group member identifies examples of a time when she felt pressured to pursue the thin-ideal. Each person develops a verbal challenge for each situation based on how she would ideally respond in the present given what she has learned during the intervention. Members then individually develop a "top-10" list of things that students can do to resist the thin-ideal. Next, leaders ask members to place their top-10 list in the context of their high school, and the group creates a master list of things that high

schoolers can do to resist the thin-ideal and improve the body image culture on campus. Group members are encouraged to think both individually (i.e., what the member could do) and systemically within the high school. The group then discusses barriers to implementing their ideas and brainstorms strategies for overcoming such barriers. Finally, participants agree to adopt a self-affirmation exit exercise to be conducted after the program ends. Exercises include choosing a friend to discuss positive aspects of each other, pledging to end negative body talk, and accepting compliments. The group ends with each member making a final comment about their experience in the group.

Measures

Dependent constructs included thin-ideal internalization, body dissatisfaction, eating disorder pathology, dietary restraint, and negative affect. Assessment consisted of a packet of self-report measures. In order to compare results from this study to previous dissonance prevention trials (primarily the work of Stice and Becker), measures were selected based on those utilized in prior trials. Appendices D-L includes all study measures. At baseline, all questionnaires were provided with original wording intact. Many surveys asked about attitudes and behaviors over the past month. For the post-intervention/waitlist and second baseline assessments, which occurred 1-2 weeks after the baseline assessment, surveys were modified, when appropriate, to reflect a one-week assessment time period. Internal consistency and item-total correlations were examined for each measure at baseline, and items with negative or poor (i.e., less than 0.20) item-total correlations were removed.

Demographics. At baseline, participants reported age, grade, ethnicity, and home country. Body Mass Index (BMI; weight in kilograms divided by height in meters squared) was calculated based on self-reported height and weight.

Thin-ideal internalization. Thin-ideal internalization was assessed using two measures that evaluate slightly different aspects of internalization. First, the Ideal Body Stereotype Scale-Revised (IBSS-R; Stice, Ziemba, Margolis, & Flick, 1996) was used to assess the endorsement of thin beauty ideals. The 6-item IBSS presents statements regarding the thin-ideal standard of female beauty. Participants rate the degree to which they agree with statements on a 5-point scale from 1 = strongly disagree to 5 = strongly agree. The IBSS-R displays convergent validity with measures of body dissatisfaction, convergent validity with measures of affect (Stice et al., 1996), and predictive validity for onset of bulimic symptoms (Stice, Fisher, & Martinez, 2004). Second, two subscales of the Sociocultural Attitudes Toward Appearance Questionnaire-3 (SATAQ-3; Thompson, van den Berg, Roehrig, Guarda, & Heinberg, 2004) were utilized to assess the internalization of societal message about beauty. The 14 items on the Internalization-General and Internalization-Athlete subscales of the SATAQ-3 assess the internalization of general appearance-based messages from TV, movies, and magazines, and the internalization of appearance-based ideals relating to athletes and sports players, respectively. Participants rate the degree to which they agree with statements on a 5-point scale from 1 = definitely disagree to 5 = definitely agree. Individuals with eating disturbances have been shown to score higher on the SATAQ-3 compared to controls (Thompson et al., 2004). The internal consistency of these internalization measures in the current sample was acceptable (IBSS-R = 0.66, SATAQ-3 = 0.91). For both

measures, items were averaged for data analysis where higher scores indicate greater belief in the construct.

Body dissatisfaction. Body dissatisfaction was assessed with an 8-item version of the Body Shape Questionnaire (BSQ). The original 34-item BSQ (Cooper, Taylor, Cooper, & Fairburn, 1987) was developed to assess preoccupation with and distress about one's body shape. Research on brief versions of the BSQ suggests the 8-item scale is a viable alternative to the longer version, demonstrating good reliability and sensitivity (Pook, Tuschen-Caffier, and Brähler, 2008). Items on the BSQ are rated on a six point scale from 1 = Never to 6 = Always. The eight BSQ items were averaged for data analysis where higher scores indicate higher levels of dissatisfaction with one's body shape and weight. The internal consistency of the scale in the current sample was high (0.91).

Eating pathology. Eating disorder pathology was assessed with the Eating Attitudes Test (EAT-26; Garner & Garfinkel, 1979). The EAT-26 is a 26-item measure of eating and weight concerns characteristic of eating disorders. Frequency of 26 behaviors are rated on a 6-point scale where 1 = never and 6 = always. The EAT is often scored using a 0-3 scoring system; however, for assessing outcome in the current study the original 1-6 scale was preserved to maintain as much individual variation within scores as possible. This method has been used with prior eating disorder measures (e.g., the Eating Disorder Inventory; Vallance, Latner, & Gleaves, 2011). Six items on the EAT-26 were removed due to unexpected negative correlations with the total scale (items 8, 13, 15, 19, 20, & 26; items 8, 19, & 20 also had item-total correlations under -0.20). The remaining 20 items were averaged for data analysis where higher scores indicate

higher levels of eating pathology. The internal consistency of the revised scale in the current sample was high (0.92).

It was also planned to use the Eating Disorders Examination Questionnaire (EDEQ; Fairburn & Beglin, 1994) as additional measure of eating pathology, since it is based on the “gold-standard” diagnostic interview and it is commonly used in similar prevention research (e.g., Becker et al., 2006, 2008, 2010). The EDEQ was used to screen for potential eating disorder diagnoses in the sample and within peer leaders, as described above. The intent was to use the total EDEQ to assess eating pathology, and also to use several of its subscales to assess other constructs. However, because the EDEQ was omitted from the post-intervention assessment time point due to time constraints, adequate data was not available to include the measure in analyses for all time points.

Dietary restraint. Dietary restraint was assessed in two ways, using the Dutch Restrained Eating Scale (DRES; van Strien, Frijters, vanStaveren, Defares, & Deurenberg, 1986) and the Dieting Subscale of the EAT-26 (EAT-Diet; Garner & Garfinkel, 1979). The DRES assesses the frequency of 10 specific dieting behaviors which are rated on a 5 point scale where 1 = never and 5 = always. The DRES shows significant correlation to measures of food intake (van Strien et al., 1986). The EAT-Diet is one of three subscales in the full measure. The 13-item EAT-Diet consists of statements about dieting behaviors and attitudes relating to the pursuit of thinness. One item was deleted from the subscale due to an unexpected negative item-total correlation (item 26; this item was also removed from the total scale and is the only reverse-scored item in the measure). The internal consistency of these measures in the current sample

was acceptable (DRES = 0.96, revised EAT-Diet = 0.92). For both measures, items were averaged for data analysis where higher scores indicate greater dietary restraint.

Negative affect. Negative Affect was assessed with The Center for Epidemiologic Studies Depression Scale (CESD; Radloff, 1977). This 20-item scale includes affective statements referring to the past week where participants rate four response options reflecting increasing levels of symptom severity (0= never/less than 1 day in past week to 3= most of the time/5–7 days in the past week). The CESD has shown good discrimination between patient and non-patient groups (Radloff, 1977). The internal consistency of the scale in the current sample was high (0.90). Items were totaled for data analysis where higher scores indicate greater depressive symptoms.

Program acceptability and application. A series of feedback questions were created for this study to gauge participants' perception of the program and as an attempt to assess perception of any changes elicited by the program. These 12 questions were grouped into three major categories. The first category was "Program Perception," with two items: (1) How much did you enjoy the *Body Image Project* and (2) Did the *Body Image Project* teach you any new information. The second category was "Change in Attitudes and Beliefs," with five items: (1) How much did the things you discussed in the *Body Image Project* change the way you feel about pursuing the thin-ideal, (2) How much did the *Body Image Project* make you want to pursue the thin-ideal less or stop pursuing it altogether, (3) How much did the *Body Image Project* make you want to pursue the thin-ideal more, (4) How much did you feel influenced by the group to change how you felt about the thin-ideal, and (5) How much did you feel influenced by your self

to change how you felt about the thin-ideal. All items were assessed post intervention using a rating scale from 1 = very much to 5 = not at all.

The third category was “Program Application,” with three items: (1) How often have you incorporated what you learned in the *Body Image Project* into your life, (2) How often do you think about the things you learned in the *Body Image Project*, and (3) How often do you talk about the *Body Image Project* with someone else. These three items were assessed post intervention and at follow-up using a rating scale from 1 = all the time to 5 = not at all. Frequencies for quantitative items were calculated to assess commonly reported attitudes and perceptions of the program.

Finally, two open-ended questions assessed attributions for change: (1) If you felt better about your body image after this program, what was the main reason, and (2) If you did not feel better about your body image after this program, what was the main reason. Open-ended items were examined qualitatively for general patterns.

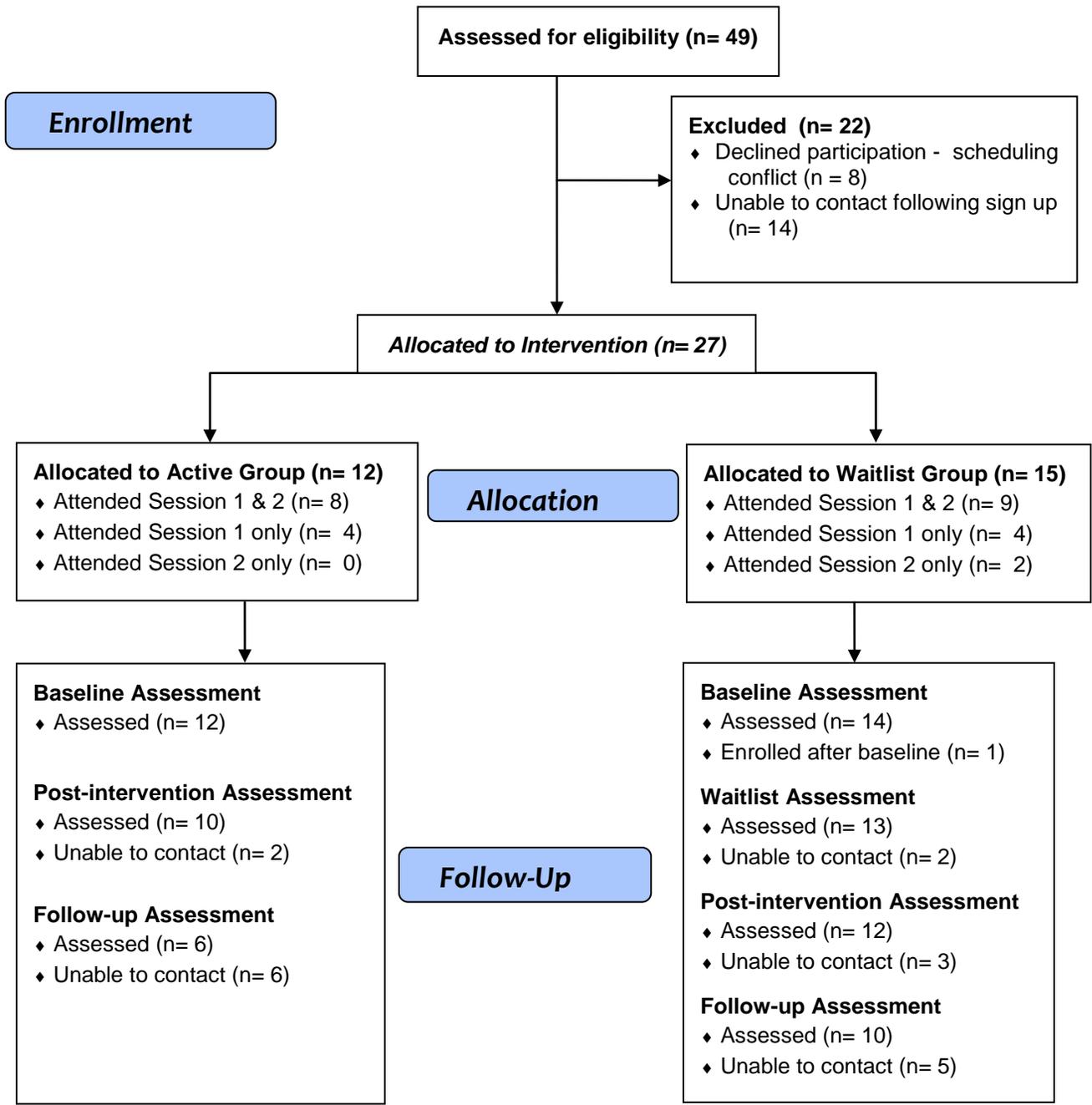
Data Analytic Plan

Figure 1 includes detailed information on participant flow. Of the 27 participants allocated in Study 1, the majority (83%) attended Session 1 and approximately two-thirds (63%) attended Session 2. Only half of participants (57%) attended both sessions. Participants who missed Session 2 were contacted to complete post-intervention measures online. One participant did not complete baseline data and was excluded from all analyses. Similar to methods used in previous studies (e.g., Becker et al., 2006, 2008), participants were screened and removed from final analyses based on probable eating disorder status. Screening involved a two-step method. First, the EAT-26 (Garner & Garfinkel, 1979) was used to identify participants at high risk. The EAT-26 is commonly

used in high school and college populations to assess eating disturbances and can be used as a screener where a cutoff score of greater than 20 indicates high risk status. For the high risk screening the original 0-3 scoring of the EAT was utilized, which differs from the scoring used for outcome assessment in the current study. Participants who scored greater than 20 on the EAT-26 were marked as having a probable eating disorder and their responses to diagnostic questions on the EDEQ (Fairburn & Beglin, 1994) were examined. All participants ($n = 3$) identified by the EAT-26 screen met criteria for a probable eating disorder and were excluded from all analyses, since the intervention is focused on prevention, not treatment.

The final study sample consisted of 23 girls (10 Active, 13 Waitlist). All study participants completed a baseline assessment, but the majority were missing data for one or more time points following baseline. Missing data points for participants were as follows: 10 participants had complete data for all time points, three were missing post-intervention data, four were missing post-intervention and follow-up data, and six were missing follow-up data only. Independent samples *t*-tests were run with all baseline outcome measures, BMI, and age. No significant differences were found between the active and waitlist groups. Given the large amount of missing data in the sample, inferential testing of outcomes was deemed inappropriate. As the focus of the study was on evaluating the initial feasibility and acceptability of the intervention, results from Study 1 are focused on qualitative information gleaned about these aspects of the research. Additionally, means were examined visually to determine whether changes in outcome were trending in the intended direction.

Figure 1. Study 1 Participant Flowchart



Study 1 Results

Intervention Adherence

All sessions were recorded, with the exception of part of Session 2 for one peer leader team, where the recorder was turned on partway through the session. Two independent raters coded each session for the presence or absence of each intervention component, using the Peer Leader Guide to compare recordings to intended scripts. Ratings were reviewed, and discrepancies were resolved by consensus. Overall kappa ratings for inter-rater reliability were acceptable ($M = 0.75$). Peer leaders conducted all sessions with acceptable levels of adherence to the manual, with Mean (SD) adherence ratings indicating that 88.83% (5.46%) of intervention components were covered across all sessions. Adherence to Session 1 material ranged from 81% to 92%, Mean (SD) = 86.33% (5.51%). Adherence to Session 2 was slightly higher overall, ranging from 86% to 96%, Mean (SD) = 91.33% (5.03%). The three peer leader teams adhered at similar rates between active and waitlist groups, with 94% and 86% adherence for the two active groups sessions, and 87% adherence overall for the waitlist group sessions.

Assessment of Outcomes

Table 1 shows the means and standard deviations for the active and waitlist groups at baseline and post-intervention/waitlist assessment time points. Table 2 shows the means and standard deviations for the active, waitlist, and total sample for each assessment point. For the between-group waitlist comparison, many means in the active appeared to have changed in the hypothesized direction; however, means in the waitlist group also dropped on several measures, indicating the possibility of a measurement

effect or regression to the mean. Regarding within-subjects change over time, overall means appeared to drop over time, suggesting reduction in risk factors. While the lack of statistical testing makes these inferences speculative, importantly, no measures indicated worsening of risk factors, with the exception of small (less than 0.25) increases in Dietary Restraint as measured by both the DRES and the EAT-26.

Table 1
Study 1 Completer Means and Standard Deviations for Waitlist Comparison

Outcome Variable	Baseline		Post	
	<i>M (SD)</i>		<i>M (SD)</i>	
Internalization: IBSS-R				
Active	3.44	(0.35)	3.04	(0.55)
WL	3.31	(0.61)	3.03	(0.51)
Internalization: SATAQ-3				
Active	3.12	(0.90)	2.52	(0.78)
WL	2.83	(0.85)	2.73	(0.74)
Body Dissatisfaction: BSQ				
Active	2.80	(1.31)	2.50	(1.17)
WL	2.56	(1.02)	2.36	(1.20)
Eating Pathology: EAT-26				
Active	5.01	(0.61)	5.18	(0.53)
WL	5.01	(0.56)	5.08	(0.66)
Dietary Restraint: DRES				
Active	2.15	(1.13)	2.01	(1.10)
WL	1.95	(0.86)	2.00	(1.00)
Dietary Restraint: EAT-Diet				
Active	4.68	(0.97)	5.07	(0.80)
WL	4.72	(0.89)	4.82	(1.02)
Negative Affect: CESD				
Active	12.75	(11.31)	12.25	(12.22)
WL	13.73	(5.95)	12.00	(5.35)

Note. Cell sizes were $n = 8$ for the active group and $n = 11$ for the waitlist group.

Table 2
Study 1 means and standard deviations for outcomes at all time points and results from the within-condition pairwise contrasts.

Outcome Variable	Baseline	Post	Follow-up
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Internalization: IBSS-R			
Active	3.64 (0.42)	3.13 (0.50)	3.00 (0.82)
WL	3.47 (0.50)	3.07 (0.27)	3.17 (0.42)
Total	3.54 (0.45)	3.09 (0.35)	3.10 (0.57)
Internalization: SATAQ-3			
Active	3.31 (1.58)	2.55 (1.11)	2.45 (0.93)
WL	3.23 (0.50)	2.49 (0.77)	2.89 (0.91)
Total	3.26 (0.92)	2.51 (0.83)	2.72 (0.88)
Body Dissatisfaction: BSQ			
Active	3.29 (1.54)	3.04 (1.73)	2.63 (1.39)
WL	2.44 (1.04)	2.29 (1.28)	2.13 (1.42)
Total	2.72 (1.20)	2.54 (1.38)	2.29 (1.34)
Eating Pathology: EAT-26			
Active	4.95 (0.60)	5.04 (0.68)	5.08 (0.73)
WL	4.81 (0.61)	4.80 (0.71)	4.69 (0.71)
Total	4.87 (0.56)	4.89 (0.66)	4.84 (0.69)
Dietary Restraint: DRES			
Active	1.90 (1.15)	2.03 (1.50)	1.97 (1.27)
WL	1.85 (0.92)	1.85 (1.30)	1.88 (1.04)
Total	1.87 (0.93)	1.91 (1.27)	1.91 (1.04)
Dietary Restraint: EAT-Diet			
Active	4.54 (1.09)	4.87 (0.97)	4.90 (1.11)
WL	4.49 (1.09)	4.68 (1.17)	4.62 (1.23)
Total	4.51 (1.01)	4.75 (1.03)	4.72 (1.11)
Negative Affect: CESD			
Active	21.67 (15.54)	21.00 (18.19)	26.33 (14.22)
WL	13.40 (8.93)	10.40 (7.44)	10.60 (8.71)
Total	16.50 (11.53)	14.37 (12.50)	16.50 (12.94)

Note. Cell sizes were $n = 3$ for the active group and $n = 6$ for the waitlist group.

Program Acceptability and Application

Appendix B includes Table 8, which reports frequencies for all responses to feedback questions at post-intervention and follow-up.

Program perception. Following the intervention, the majority of participants (61%) indicated they enjoyed the program “very much” or “a lot.” An additional 33% indicated they enjoyed the program “a medium amount.” Approximately two-thirds of participants (72%) indicated they learned “very much” or “a lot” of new information from the program. An additional 22% indicated they learned “a medium amount” of new information.

Change in attitudes and beliefs. When assessed post-intervention, approximately a third of participants (39%) indicated that the program changed their feelings about pursuing the thin-ideal “very much” or “a lot.” An additional 56% said the program changed their feelings “a medium amount.” Further, the majority of participants said the program made them want to pursue the thin-ideal “a lot” less (39%), or “a medium amount” less (44%). In contrast, a minority of participants indicated the program made them want to pursue the thin-ideal “very much” more (6%) and no participants reported the program made them want to pursue the thin-ideal “a lot” more. Most (44%) said the program did “not at all” make them want to pursue the thin-ideal more. When asked about the source of perceived pressure to change, most participants (88%) indicated they were influenced “a medium amount” or more by their group to change their beliefs about the thin-ideal. Almost all participants (94%) indicated they were influenced “a medium amount” or more by themselves to change their beliefs about the thin-ideal.

Program application. At post-intervention assessment, approximately two-thirds (67%) of participants said they incorporated things they learned in the program “a lot” or “a medium amount” into their life. At follow-up assessment, more than half of participants (54%) still reported they incorporated things they learned in the program “all the time,” “a lot,” or “a medium amount” into their life. Post-intervention, a majority of participants (89%) indicated that they thought about the things they learned in the program “all the time,” “a lot” or “a medium amount.” At follow-up, three-quarters of participants (77%) still reported they thought about the things they learned in the program “a lot” or “a medium amount.” Post-intervention, approximately a quarter of participants (28%) indicated that they talked about the program “a medium amount” with someone else. An additional 56% indicated they talked about the program “a little” with others. At follow-up, approximately half (54%) of participants reported they still talked about the program “a medium amount” with someone else, and another 39% reported they talked about the program “a little” with others.

Taken together, these results suggest that the majority of participants enjoyed the intervention, perceived it as informative, and perceived some positive changes in attitudes due to the program. Further, when group members were asked if they would like to be informed about future opportunities as peer leaders, 39% said yes, indicating that many participants viewed the program positively enough to possibly take on a peer leader responsibility in the future.

Open-ended questions. A majority (83%) of participants responded to the open-ended question, “if you felt better about your body image following the program, what

was the main reason.” Responses were examined for general patterns, and appeared to be distributed across four major topic areas. Appendix C includes Table 9, which reports all participant responses, classified within these general patterns. The first topic area, endorsed by 46% of respondents, was related to acceptance of appearance, weight, and shape. Sample responses include, “I felt like I should appreciate what type of body I have” and “That I accepted what I didn't like.” The second topic area, endorsed by 32% of respondents, was related to normalized body image discontent within the group. Sample responses include, “Because other girls feel the same as me and have similar problems,” and “That others go through the same stuff.” The third topic area, endorsed by 11% of respondents, was related to rejecting the thin-ideal. A sample response was, “I'm not being pressured to look perfect like the people in magazines.” The fourth topic area, endorsed by 11% of respondents included “miscellaneous” responses that did appear to fit within another category. A sample response was, “There's a lot of stuff that I didn't know before.”

In comparison, a minority (17%) of participants responded to the question, “if you did not feel better about your body image following the program, what was the main reason.” Responses to this question appeared to cluster into two major topic areas. The first topic area, endorsed by 50% of respondents, was that the information was not persuasive. A sample response was, “I felt the same.” The second topic area, endorsed by 50% of respondents, was more negative, and seemed to reflect the continued perception of thin-ideal pressure. A sample response was “Because none of the peer leaders were bigger like I am.”

Study 1 Discussion

The purpose of Study 1 was to perform an initial evaluation of the feasibility, acceptability, and effectiveness of a dissonance-based prevention program delivered by peer leaders in a high school setting. The dissonance program was endorsed by the participating school and delivered on an elective basis to high school girls interested in the program. Results from this initial trial are promising, and provide tentative support that dissonance-based prevention can be implemented by high school peer leaders.

The evaluation of intervention fidelity supports the hypothesis that high school peer leaders can be trained to deliver the dissonance-based program with a high level of adherence to a manual adapted for this population. Adherence to major components of the intervention, as delivered by peer leader teams of three or four high school girls, ranged from 81% to 91% between the two intervention sessions. When using endogenous providers, as compared to professionals, interventionists may not be as familiar with program content and may not have prior experience in delivering group interventions. Therefore, the level of adherence reached by the high school peer leaders in the current study appears to be acceptable. Moreover, it indicates that the majority of program material was covered, and group members received an acceptable version of the intervention.

Further, feedback from Study 1 indicates that this intervention was highly acceptable when delivered in this manner. Formal feedback on the program suggested that all participants enjoyed the program and all reported that they learned new information from the program. In addition, most participants reported the program made

them want to change their feelings about pursuing the thin-ideal. A majority of participants reported that after the intervention and through follow-up, they thought about the program, incorporated its messages into their life, and talked about it with others. Informal feedback from key staff members was consistent with student feedback, with reports of positive impressions of the program. Further, following the program, the administration expressed support for continued implementation within the school setting.

While it cannot be conclusively stated that this program has a positive effect on eating disorder risk factors, in general, a visual examination of means for outcome measures indicated positive changes or no negative changes. Since the purpose of Study 1 was to evaluate the program for initial feasibility and potential for implementation in this setting, the results of the project overall appear to support the continued exploration of dissonance-based prevention using peer leaders in this age group. Several key limitations to the current study include a high dropout rate resulting in a large proportion of missing data and known differences between active and waitlist group members (i.e., boarding versus day students who may differ in ethnicity and socioeconomic status, among other factors) that may preclude their comparison. Following the completion of Study 1, the participating school requested that the intervention be delivered on a wider basis within the school. Study 2 was designed in collaboration with the participating school to address these limitations.

Study 2 Method

Study 2 was implemented in the Fall of 2011. One goal of Study 2 was to work with the school to make improvements to the research design and program implementation. Changes were initiated based on feedback from participants and results

and lessons learned from Study 1. A second goal of Study 2 was to conduct a larger trial with a longer follow-up to evaluate the effectiveness of the peer-delivered dissonance program in reducing eating disorder risk factors.

Program Changes

Debriefing sessions were held with peer leaders, group members, and school personnel involved in Study 1 to solicit ways to improve the program implementation. Preliminary results and feedback from Study 1 were also examined and several changes were executed. First, in order to provide the program to a greater number of students, the school requested to change the implementation format to provide the program as part of the school's "freshman foundations" health course, required for all 9th grade students. Several methodological changes followed as a result of this new implementation, the largest of which was that the school took on responsibility for executing all aspects of recruitment, intervention execution, and data collection. A second change that followed was the request to streamline assessment instruments to create a briefer survey. Using results from Study 1 as a guide, several measures were removed. Changes in measures are described below.

Participants

Peer leaders for Study 2 were 10 junior and senior girls recruited through the school counselor. These peer leaders formed three teams. Each peer leader team led two groups during the semester, one with the active cohort and one with the waitlist cohort. Peer leader selection, recruitment, and training are described below.

Group members for Study 2 were 51 freshman girls who participated as a mandatory component of their freshman health class. Participant age ranged from 13-15

years, Mean (SD) = 13.98 (0.59) years. Baseline BMI ranged from 16.44 to 30.02, Mean (SD) = 20.92 (2.98). Group members were primarily Caucasian (40%), Hawaiian or Pacific Islander (32%), Other/Mixed (18%), or Asian (10%). The majority (86%) were born in the United States and most (74%) were day students, although all groups within class periods included both boarding and day students.

Procedure

Overview of study. Intervention sessions were conducted within classrooms during the school day. Male students were asked to report to the counseling center for a parallel activity while female students remained in the classroom to participate in the intervention. As with Study 1, group allocation was determined based on scheduling feasibility. To accommodate the school's academic calendar, girls in three health class periods in the first school quarter ($n = 25$) were allocated to receive the intervention right away as active group members, and girls in three health class periods in the second school quarter ($n = 26$) were allocated to the waitlist control group to receive the intervention two weeks later. As with Study 1, the intervention consisted of two sessions, each lasting approximately 1.5 hours. Slightly different from Study 1, Session 1 and Session 2 were held 2 days apart, to fit with the school schedule. Active and waitlist groups received the same intervention and the same peer leader teams delivered the intervention to both active and waitlist group members. Therefore, each peer leader team conducted two groups during the semester. Groups ranged in size from six to 12 group members and contained three or four peer leaders.

Active group members were asked to fill out surveys the week before Session 1 (baseline). Waitlist group members completed a baseline assessment close to the same

day active group members began the intervention, and then completed a second baseline/waitlist assessment before they participated in Session 1 two weeks later. All group members (active and waitlist) were asked to complete surveys after they completed Session 2 (post-intervention). The classroom teacher administered baseline surveys, and peer leaders collected post-intervention surveys. Between two and four months after the program, the classroom teacher asked all participants to complete a follow-up assessment online using SurveyMonkey.com. No monetary or other compensation was offered for participating in the follow-up assessment. Follow-up assessments were completed an average of three months after Session 2 was completed, Mean (SD) = 11.43 (6.18) weeks. All procedures were approved by the University of Hawaii IRB and the participating school.

Peer leader recruitment, selection, and training. Peer leader recruitment and selection were identical to Study 1. Thirteen girls from the junior and senior class attended the peer leader informational meeting and 10 signed up to become peer leaders. The EDEQ (Fairburn & Beglin, 1994) was used to screen for active eating disorder symptoms. No potential peer leaders met diagnostic criteria for a probable eating disorder. All 10 (nine seniors, one junior) girls were invited to complete peer leader training. Almost half of peer leaders had some prior experience with the program; one was a peer leader for Study 1, and three participated as group members in Study 1. One peer leader was only able to complete Day 2 of training; she was paired with the most senior peer leader to catch up on the material she missed in Day 1. The remaining nine peer leaders completed 12 hours of training over a two-day period. Three teams of peer leaders were formed during training (one group of four and two groups of three). The

same three female doctoral students from Study 1 conducted peer leader training in Study 2. Peer leader training was identical to Study 1.

Peer leader supervision. As the school was responsible for program execution, the lead author did not conduct on-site monitoring of groups as they were being implemented. Peer leaders were instructed to contact the school counselor to assist if any urgent situation were to arise, although none did. No formal review and feedback for group implementation took place, but peer leader teams were contacted informally by phone between Session 1 and 2 to ask if supervision was needed. One peer leader team during active group implementation asked for advice on dealing with quiet group members. All other peer leader teams declined supervision between sessions.

As in Study 1, peer leaders were asked to audio record all intervention sessions in order to assess adherence. All intervention sessions were rated for adherence using detailed adherence checklists created by the lead author based on the Peer Leader Guide.

Dissonance-based intervention. No changes were made to the intervention or the Peer Leader Guide between Study 1 and Study 2. Sessions were identical to those described in Study 1.

Measures

In an effort to streamline the survey instrument, one construct (negative affect) was dropped. The four dependent constructs assessed in both studies were thin-ideal internalization, body dissatisfaction, eating disorder pathology, and dietary restraint. In order to compare results from this study to Study 1, the majority of measures used to assess each construct were identical. One additional full survey was dropped (DRES) and replaced with a shorter measure of dietary restraint measured by a subscale on the

EDEQ. Altogether, 30 survey items were removed. When making decisions about changes in measures, effort was made to retain multiple measures for each construct in order to increase measurement reliability and to draw comparisons to previous studies. One of these efforts included administering the EDEQ at all assessment time points so that it could be used in all study analyses. At baseline, all questionnaires were provided with original wording intact. Many surveys asked about attitudes and behaviors over the past month. For the post-intervention/waitlist and second baseline assessments, which occurred 1-2 weeks after the baseline assessment, surveys were modified, when appropriate, to reflect a one-week assessment time period. As with Study 1, internal consistency and item-total correlations were examined for each measure at baseline, and items with negative or poor (i.e., less than 0.20) item-total correlations were removed.

Demographics. The demographic information collected was identical to Study 1.

Thin-ideal internalization. As with Study 1, thin-ideal internalization was assessed using the Ideal Body Stereotype Scale-Revised (IBSS-R; Stice, Ziemba, Margolis, & Flick, 1996) and the two internalization subscales (Internalization-General and Internalization-Athlete) of the Sociocultural Attitudes Toward Appearance Questionnaire-3 (SATAQ-3; Thompson, van den Berg, Roehrig, Guarda, & Heinberg, 2004). The internal consistency of these measures in the current sample was acceptable (IBSS-R = 0.76, SATAQ-3 = 0.88). For both measures, items were averaged for data analysis where higher scores indicate greater internalization.

Body dissatisfaction. As with Study 1, the 8-item Body Shape Questionnaire (BSQ; Cooper, Taylor, Cooper, & Fairburn, 1987) was utilized, and the Weight Concern and Shape Concern subscales of the Eating Disorders Examination Questionnaire

(EDEQ-WSC; Fairburn & Beglin, 1994) was added for an additional measure of body dissatisfaction. The 28-item EDEQ asks a series of questions focused on disordered attitudes and behaviors related to eating, shape, and weight over the past month. Items are rated either on their frequency (how many out of the past 28 days from 0 = no days to 6 = every day) or severity (from 0 = not at all to 6 = markedly). The EDEQ consists of diagnostic items and also contains four subscales: Restraint, Weight Concern, Eating Concern, and Shape Concern. Each subscale has acceptable internal consistency and short-term (two week) test-retest reliability (Luce & Crowther, 1999). The internal consistency of these measures in the current sample was high (BSQ = 0.93, EDEQ-WSC = 0.86). For both measures, items were averaged for data analysis where higher scores indicate greater body dissatisfaction.

Eating pathology. As with Study 1, the EAT-26 (Garner & Garfinkel, 1979) was used to measure eating pathology. Two items were removed due to low item-total correlations (items 13 and 26). The internal consistency of the revised scale was high (0.92). The EDEQ-Total (Fairburn & Beglin, 1994) was added for an additional measure of eating pathology, measured as the average of all subscale scores on the EDEQ. The internal consistency of the EDEQ-Total in the current sample was high (0.95). For both measures, items were averaged for data analysis where higher scores indicate greater eating disorder pathology.

Dietary restraint. The DRES (van Strien, Frijters, vanStaveren, Defares, & Deurenberg, 1986) was dropped from Study 2 to create a shorter survey. As with Study 1, the Dieting Subscale of the EAT-26 (Garner & Garfinkel, 1979) was used to assess dietary restraint. One item was removed due to low item-total correlation (item 26). The

internal consistency of the revised scale was high (0.93). The Restraint subscale of the EDEQ (EDEQ-R; Fairburn & Beglin, 1994) was added for an additional measure of dietary restraint. The internal consistency of the EDEQ-R in the current sample was high (0.83). For both measures, items were averaged for data analysis where higher scores indicate greater dietary restraint.

Negative affect. To create a shorter survey, the CESD was dropped and no measure of negative affect was included in Study 2.

Program acceptability and application. Feedback questions collected were identical to Study 1.

Data Analytic Plan

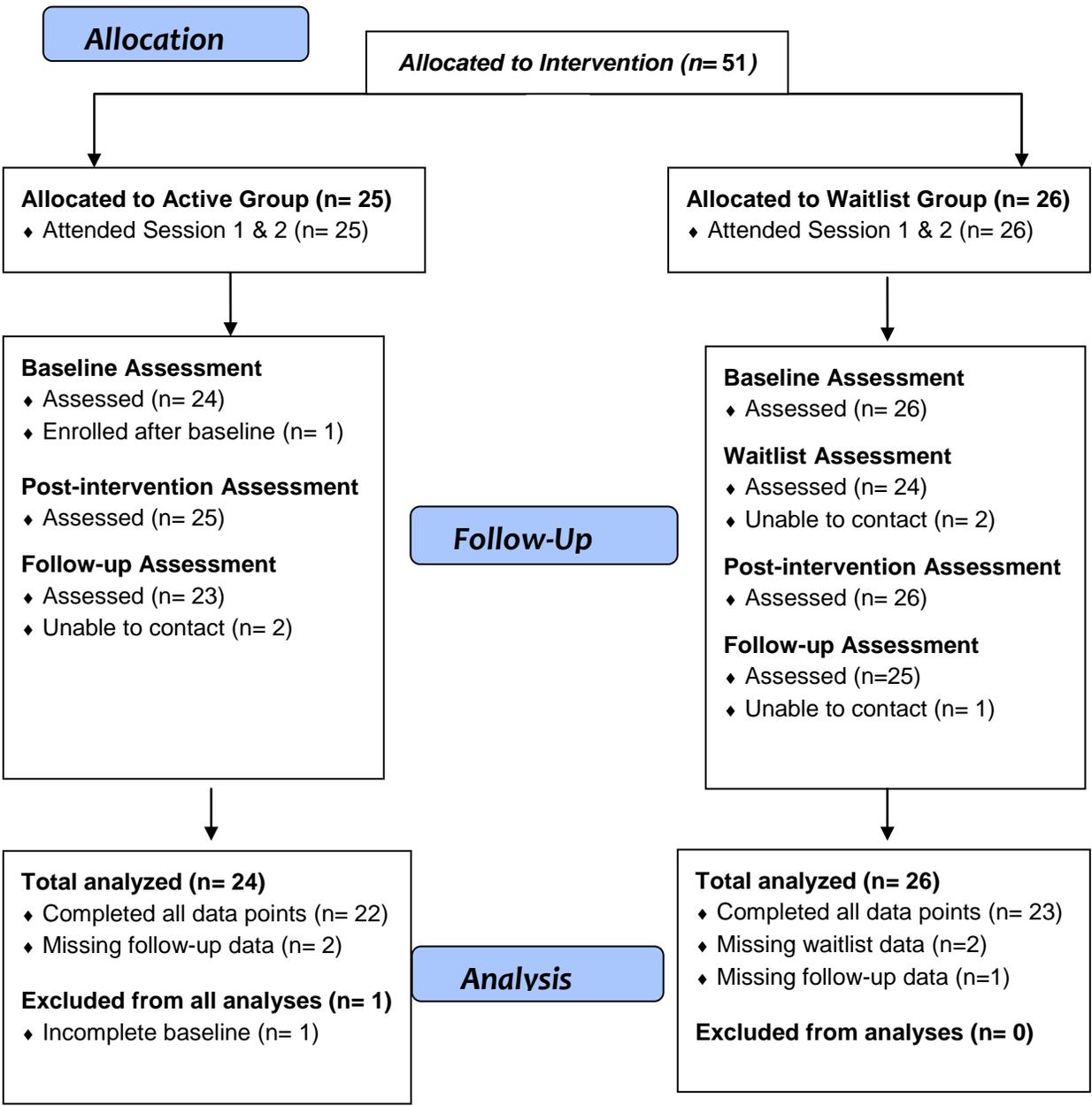
Figure 2 includes detailed information on participant flow for Study 2. Of the 51 participants allocated in Study 2, all (100%) attended both intervention sessions. As in Study 1, several participants ($n = 4$) were identified as high eating disorder risk, using a cutoff score of 20 on the baseline Eating Attitudes Test (Garner & Garfinkel, 1979). However, when diagnostic criteria from the EDEQ were examined for these participants, none reported symptoms consistent with a probable eating disorder. Results of analyses on study completers with and without these participants were identical. Therefore, these participants were included in all analyses.

One participant did not complete baseline data and was excluded from all analyses. Missing data for one or more time points following baseline were as follows: two waitlist participants were missing second baseline/waitlist assessment data, and three participants were missing follow-up data. The majority of participants ($n = 45$; 22 Active

group; 23 Waitlist) had complete data for all time points. To account for missing data, analyses were run on participants with data available per each analysis.

Independent samples *t*-tests were run with all baseline outcome measures, BMI, and age. No significant differences were found between the active and waitlist groups. A series of repeated measures ANOVAs were conducted to examine changes in dependent variables (thin-ideal internalization, body dissatisfaction, eating pathology, and dietary restraint) over time.

Figure 2. Study 2 Participant Flowchart



Study 2 Results

Intervention Adherence

Due to technical difficulties with the digital recorder, two peer leader teams were unable to record Session 1. All peer leader teams recorded Session 2. Two independent raters coded each session for the presence or absence of each intervention component, using the Peer Leader Guide to compare recordings to intended scripts. Ratings were reviewed, and discrepancies were resolved by consensus. Overall kappa ratings for inter-rater reliability were acceptable ($M = 0.71$). Peer leaders conducted all sessions with acceptable levels of adherence to the manual, with Mean (SD) adherence ratings indicating that 88.41% (4.61%) of intervention components were covered across all sessions. Adherence to Session 1 material ranged from 74% to 97%, Mean (SD) = 86.39% (11.96%). Adherence to Session 2 material ranged from 85% to 95%, Mean (SD) = 80.76% (5.82%). The peer leader teams adhered at slightly higher rates for active groups ($M = 96.44\%$, $SD = 4.61\%$) compared to waitlist groups ($M = 85.70\%$, $SD = 8.63$).

Waitlist Comparison

A series of 2 (time: baseline, post/waitlist) by 2 (group: active, waitlist) repeated measures ANOVAs examined changes in outcomes following participation in the intervention for active group members compared to the waitlist group. Table 3 presents ANOVA results. Table 4 shows the means and standard deviations for the active and waitlist groups at baseline and post-intervention/waitlist assessment time points.

Internalization. For both IBSS-R and SATAQ-3, analysis revealed a significant time effect and a significant group by time interaction. These results indicate that the

intervention successfully reduced internalized thin-ideal attitudes compared to the waitlist control.

Body dissatisfaction. For BSQ, analysis revealed a significant time effect and a significant group by time interaction. For EDEQ-WSC, analysis revealed a significant time effect but no significant group by time interaction. These results suggest that the intervention successfully reduced one aspect of body dissatisfaction compared to the waitlist control, as measured by the BSQ. Weight and shape concern as measured by the EDEQ-WSC was reduced over time for all participants, with no differences following the intervention compared to the waitlist control.

Eating pathology. Analysis of EAT-26 revealed no time effect but a significant group by time interaction. Analysis of EDEQ-Total revealed a time effect but no group by time interaction. These results indicate that eating pathology as measured by the EAT-26 was significantly lower following the intervention compared to the waitlist control. Eating pathology as measured by the EDEQ-Total was reduced over time for all participants, with no differences following the intervention compared to the waitlist control.

Dietary restraint. Analysis for EAT-Diet revealed a significant time effect and a significant group by time interaction. Analysis for EDEQ-R revealed no time effect and no group by time interaction. These results indicate that the intervention successfully reduced one aspect of dietary restraint, measured by the EAT-Diet compared to the waitlist control. Dietary restraint as measured by the EDE-R was reduced over time for all participants, with no differences following the intervention compared to the waitlist control.

Table 3
 Study 2 Waitlist Comparison Analyses

Source	<i>df</i>	<i>F</i> -value	<i>p</i> -value	η^2
Internalization: IBSS-R				
Time	1,46	11.77	.001*	.20
Time x Group	1,46	16.29	.000*	.26
Internalization: SATAQ-3				
Time	1,46	27.96	.000*	.38
Time x Group	1,46	26.08	.000*	.36
Body Dissatisfaction: BSQ-8				
Time	1,46	14.18	.000*	.24
Time x Group	1,46	7.90	.007*	.15
Body Dissatisfaction: EDEQ-WSC				
Time	1,46	7.37	.009*	.14
Time x Group	1,46	3.24	.078	.07
Eating Pathology: EAT-26				
Time	1,46	3.66	.062	.07
Time x Group	1,46	6.48	.014*	.12
Eating Pathology: EDEQ-Total				
Time	1,46	7.56	.008*	.14
Time x Group	1,46	2.87	.097	.06
Dietary Restraint: EAT-Diet				
Time	1,46	14.47	.000*	.24
Time x Group	1,46	10.84	.002*	.19
Dietary Restraint: EDEQ-R				
Time	1,46	3.61	.064	.07
Time x Group	1,46	0.88	.353	.02

Note. Asterisks indicate significant effect with significance level set at $p < .05$.

Table 4
Study 2 Completer means and standard deviations for Waitlist Comparison

Outcome Variable	Baseline	Post
	<i>M (SD)</i>	<i>M (SD)</i>
Internalization: IBSS-R		
Active _a	3.28 (0.55)	2.79 (0.64)
WL _b	3.29 (0.54)	3.33 (0.73)
Internalization: SATAQ-3		
Active _a	2.91 (0.68)	2.22 (0.66)
WL _b	2.84 (0.83)	2.83 (0.82)
Body Dissatisfaction: BSQ-8		
Active _a	2.45 (1.08)	1.81 (0.64)
WL _b	2.71 (1.20)	2.62 (1.30)
Body Dissatisfaction: EDEQ-WSC		
Active	1.71 (1.54)	1.17 (1.18)
WL	2.28 (1.80)	2.18 (1.78)
Eating Pathology: EAT-26		
Active _a	1.93 (0.81)	1.64 (0.71)
WL _b	2.05 (0.71)	2.10 (0.99)
Eating Pathology: EDEQ-Total		
Active	1.39 (1.32)	0.91 (0.99)
WL	1.90 (1.58)	1.78 (1.53)
Dietary Restraint: EAT-Diet		
Active _a	2.18 (1.13)	1.69 (0.86)
WL _b	2.31 (1.03)	2.27 (1.23)
Dietary Restraint: EDEQ-R		
Active	0.76 (1.08)	0.38 (0.70)
WL	1.14 (1.40)	1.01 (1.37)

Note. Subscript letters in the leftmost column indicate significant differences between groups ($p < .05$). Cell sizes were $n = 24$ for the active group and $n = 24$ for the waitlist group.

Change Over Time

A series of 3 (time: baseline, post, follow-up) by 2 (group: active, waitlist) repeated measures ANOVAs were run to examine the effect of the intervention over time for all group members. The group variable was added in order to examine the possibility of differential change over time between waitlist and control groups, although it was not expected that these groups would differ. All time effects were explored with post-hoc simple contrasts, regardless of the significance of the overall F. Results are reported below for comparisons of baseline (T1), post-intervention (T2), and follow-up (T3). Table 5 presents ANOVA results, including effect sizes for comparisons. Table 6 shows the means and standard deviations for the active, waitlist, and total sample for each assessment point. Table 7 shows calculated within group Cohen's *d* effect sizes for post-intervention and follow-up in Study 1 and Study 2 and for comparable time points in the most recently published dissonance-based effectiveness trials (Becker et al., 2006, 2008, 2010, Stice et al., 2009).

Internalization. For both IBSS-R and SATAQ-3, analysis revealed a significant effect for time. Post-hoc simple contrasts revealed the same pattern of results for IBSS-R and SATAQ-3, with significant differences T1 to T2, and no significant differences T1 to T3 or T2 to T3. Further, analyses both revealed a significant group by time interaction for SATAQ-3 scores, indicating that contrary to expectation, active and waitlist groups responded at different rates. Post-hoc simple contrasts on interaction effects revealed the same pattern of results: a significant difference T1 to T2 and T2 to T3, but no significant difference T1 to T3. No significant group by time interaction emerged for IBSS-R scores. Taken together, these results suggest that overall, while internalization was

reduced during the intervention, scores returned to near baseline levels by follow-up. Rates of change over time were similar for all participants on IBSS-R scores, but for SATAQ-3, participants who received the program within active groups experienced greater reduction in internalization scores from baseline to post-intervention and greater rebound in scores post-intervention to follow-up compared participants who received the program within waitlist groups.

Body dissatisfaction. Analysis for BSQ and EDEQ-WSC revealed the same pattern of results. All analyses revealed a significant time effect and no group by time interaction. Post-hoc within-group simple contrasts revealed significant differences T1 to T2, T1 to T3, and no differences T2 to T3. This indicates that all measured aspects of body dissatisfaction were reduced during the intervention, and this effect was maintained over time. Further, all effects were similar for all participants.

Eating pathology. Analyses for EAT-26 both revealed a significant effect for time and no group by time interaction. Post-hoc simple contrasts revealed a significant difference T1 to T2, and no significant differences in other comparisons. Analyses for EDEQ-Total revealed a significant effect for time and no group by time interaction. Post-hoc simple contrasts revealed the same pattern of results, with significant differences T1 to T2, T1 to T3, and no differences T2 to T3. These results suggest that one aspect of eating pathology, measured with the EDEQ-Total, was reduced during the intervention, and changes were maintained over time. Eating pathology as measured with the EAT-26, however, was reduced during the intervention but scores returned to near baseline levels by follow-up. All effects were similar for all participants.

Dietary restraint. Analyses for EAT-Diet and EDEQ-R revealed the same pattern of results. All analyses revealed a significant time effect and no group by time interaction. Post-hoc within-group simple contrasts revealed significant differences T1 to T2, T1 to T3, and no differences T2 to T3. This indicates that all measured aspects of dietary restraint were reduced during the intervention, and this effect was maintained over time. Further, all effects were similar for all participants.

Table 5
Study 2 Change Over Time Analyses

Source	<i>df</i>	<i>F</i> -value	<i>p</i> -value	η^2
Internalization: IBSS-R				
Time	2,44	12.66	.000*	.37
Time x Group	2,44	0.28	.755	.01
Internalization: SATAQ-3				
Time	2,44	20.91	.000*	.49
Time x Group	2,44	7.32	.002*	.25
Body Dissatisfaction: BSQ-8				
Time	2,44	11.07	.000*	.34
Time x Group	2,44	0.70	.502	.03
Body Dissatisfaction: EDEQ-WSC				
Time	2,44	9.64	.000*	.31
Time x Group	2,44	0.15	.862	.01
Eating Pathology: EAT-26				
Time	2,44	8.01	.001*	.27
Time x Group	2,44	0.29	.751	.01
Eating Pathology: EDEQ-Total				
Time	2,44	9.01	.001*	.29
Time x Group	2,44	0.20	.818	.01
Dietary Restraint: EAT-Diet				
Time	2,44	19.49	.000*	.47
Time x Group	2,44	0.10	.909	.00
Dietary Restraint: EDEQ-R				
Time	2,44	2.99	.061	.12
Time x Group	2,44	0.27	.768	.01

Note. Asterisks indicate significant effect with significance level set at $p < .05$.

Table 6
Study 2 means and standard deviations for outcomes at all time points and results from the within-condition pairwise contrasts

Outcome Variable	Baseline	Post	Follow-up
	Mean (SD)	Mean (SD)	Mean (SD)
Internalization: IBSS-R			
Active	3.30 (0.58)	2.79 (0.64)	3.15 (0.80)
WL	3.34 (0.55)	2.96 (0.81)	3.27 (0.70)
Total	3.32 _a (0.55)	2.88 _b (0.73)	3.21 _{ab} (0.74)
Internalization: SATAQ-3			
Active _a	2.96 (0.68)	2.18 (0.68)	2.82 (0.47)
WL _b	2.91 (0.85)	2.71 (0.83)	2.87 (0.86)
Total	2.93 _a (0.77)	2.46 _b (0.80)	2.85 _{ab} (0.70)
Body Dissatisfaction: BSQ-8			
Active	2.51 (1.11)	1.80 (0.67)	1.87 (0.87)
WL	2.81 (1.23)	2.42 (1.28)	2.34 (1.32)
Total	2.67 _a (1.17)	2.13 _b (1.07)	2.12 _b (1.14)
Body Dissatisfaction: EDEQ-WSC			
Active	1.79 (1.57)	1.20 (1.23)	1.15 (1.02)
WL	2.45 (1.87)	1.96 (1.63)	1.72 (1.51)
Total	2.14 _a (1.75)	1.60 _b (1.49)	1.45 _b (1.32)
Eating Pathology: EAT-26			
Active	1.98 (0.83)	1.68 (0.73)	1.81 (0.79)
WL	2.12 (0.72)	1.88 (0.82)	2.06 (1.01)
Total	2.06 _a (0.77)	1.79 _b (0.78)	1.94 _{ab} (0.91)
Eating Pathology: EDEQ-Total			
Active	1.43 (1.37)	0.93 (1.03)	0.90 (0.83)
WL	2.00 (1.60)	1.63 (1.39)	1.43 (1.42)
Total	1.74 _a (1.51)	1.30 _b (1.27)	1.18 _b (1.20)
Dietary Restraint: EAT-Diet			
Active	2.24 (1.17)	1.68 (0.73)	1.81 (0.78)
WL	2.39 (1.02)	1.89 (0.82)	2.05 (1.01)
Total	2.32 _a (1.08)	1.79 _b (0.78)	1.94 _b (0.91)
Dietary Restraint: EDEQ-R			
Active	0.71 (1.07)	0.39 (0.73)	0.40 (0.56)
WL	1.13 (1.38)	0.95 (1.26)	0.85 (1.50)
Total	0.93 _a (1.25)	0.69 _b (1.08)	0.64 _b (1.17)

Note: Cell sizes were $n = 22$ for the active group and $n = 25$ for the waitlist group. Means within the same row with different subscripts indicate significant differences between time points ($p < .05$).

Subscript letters in the leftmost column indicate significant differences between groups ($p < .05$).

Table 7
Within-group effect sizes in the current studies and previous effectiveness trials

Outcome Variable	Study 1		Study 2		Becker et al., 2006		Becker et al., 2008		Becker et al., 2010		Stice et al., 2009	
	Post <i>d</i>	6-wk FU <i>d</i>	Post <i>d</i>	3-mo FU <i>d</i>	Post <i>d</i>	7-wk FU <i>d</i>	Post <i>d</i>	7-wk FU <i>d</i>	Post <i>d</i>	8-wk FU <i>d</i>	Post <i>d</i>	6-mo FU <i>d</i>
Internalization												
IBSS-R	0.94	0.82	0.68	0.16	0.55	0.50	0.87	0.53	0.74	0.11	0.66	0.33
SATAQ-3	0.66	0.25	0.52	0.08	--	--	--	--	--	--	--	--
Body Dissatisfaction												
BSQ	0.25	0.44	0.30	0.46	0.23	0.36	0.33	0.33	--	--	--	--
EDEQ-WSC	--	--	0.33	0.32	--	--	--	--	0.50	0.45	--	--
SD-BPS	--	--	--	--	--	--	--	--	--	--	0.52	0.42
Eating Pathology												
EAT-26	0.05	0.23	0.32	0.08	--	--	--	--	--	--	--	--
EDEQ-Total	--	--	0.35	0.33	--	--	--	--	--	--	--	--
Symptom Composite	--	--	--	--	0.32	0.36	0.36	0.59	0.54	0.39	0.59	0.54
Dietary Restraint												
DRES	0.11	0.15	--	--	0.24	0.26	--	--	--	--	0.64	0.48
EAT-Diet	-0.17	0.00	0.40	0.18	--	--	--	--	--	--	--	--
EDEQ-R	--	--	0.25	0.27	--	--	0.31	0.52	0.64	0.49	--	--
Negative Affect												
CESD	0.08	-0.26	--	--	--	--	--	--	--	--	NR	NR
PANAS	--	--	--	--	--	--	--	--	0.51	0.25	--	--

Note. Different survey instruments were used to assess construct across different studies. PANAS = Positive and Negative Affective Schedule; SD-BPS = Satisfaction and Dissatisfaction with Body Parts Scale; NR = outcome collected but not reported.

Program Acceptability and Application

Appendix B includes Table 8, which reports frequencies for all responses to feedback questions for Study 1 and Study 2 at post-intervention and follow-up.

Program perception. Following the intervention, the majority of participants (60%) indicated they enjoyed the program “very much” or “a lot.” An additional 34% indicated they enjoyed the program “a medium amount.” Approximately two-thirds of participants (68%) indicated they learned “very much” or “a lot” of new information from the program. An additional 26% indicated they learned “a medium amount” of new information.

Change in attitudes and beliefs. When assessed post-intervention, half of participants (50%) indicated that the program changed their feelings about pursuing the thin-ideal “very much” or “a lot.” An additional 28% said the program changed their feelings “a medium amount.” Further, the majority of participants said the program made them want to pursue the thin-ideal “very much” less (18%), “a lot” less (30%), or “a medium amount” less (28%). In contrast, a minority of participants indicated the program made them want to pursue the thin-ideal “very much” more (2%) or “a lot” more (8%). The majority (62%) said the program did “not at all” make them want to pursue the thin-ideal more. When asked about the source of perceived pressure to change, most participants (68%) indicated they were influenced “a medium amount” or more by their group to change their beliefs about the thin-ideal. A slightly greater proportion of participants (72%) indicated they were influenced “a medium amount” or more by themselves to change their beliefs about the thin-ideal.

Program application. At post-intervention assessment, approximately three-

quarters of participants (72%) said they incorporated things they learned in the program “a lot” or “a medium amount” into their life. At follow-up assessment, approximately half of participants (53%) still reported they incorporated things they learned in the program “all the time,” “a lot,” or “a medium amount” into their life. Post-intervention, approximately two-thirds of participants (66%) indicated that they thought about the things they learned in the program “a lot” or “a medium amount.” At follow-up, nearly half of participants (44%) still reported they thought about the things they learned in the program “all the time,” “a lot,” or “a medium amount.” Post-intervention, approximately half of participants (45%) indicated that they talked about the program “a lot” or “a medium amount” with someone else. At follow-up, a fifth (20%) of participants reported they still talked about the program “a lot” or “a medium amount” with someone else.

Taken together, these results suggest that the majority of participants enjoyed the intervention, viewed it as informative, and perceived some positive changes in attitudes due to the program. Further, when group members were asked if they would like to be informed about future opportunities as peer leaders, 43% said yes, indicating that many participants viewed the program positively enough to consider taking on a peer leader responsibility in the future.

Open-ended questions. A majority (88%) of participants responded to the open-ended question, “if you felt better about your body image following the program, what was the main reason.” Responses were examined for general patterns, and appeared to be distributed across five major topic areas (four of which were overlapping with Study 1 topic areas). Appendix C includes Table 9, which reports all participant responses for Study 1 and Study 2, classified within these general patterns. The first topic area,

endorsed by 32% of respondents, was related to normalized body image discontent within the group. Sample responses include, “I realize that everyone has flaws,” and “I felt better because I know that everyone feels the same way at a point but I don't have to try hard to be perfect.” The second topic area, endorsed by 25% of respondents, was related to acceptance of appearance, weight, and shape. Sample responses include, “Now I know I am perfect the way I am and everyone should love me for me,” and “Because I'm pretty in my own way and that I shouldn't compare myself to other girls.” The third topic area, endorsed by 20% of respondents, was related to rejecting the thin-ideal. A sample response was, “The main reason was that I realized that the thin-ideal is impossible to achieve.” The fourth topic area, endorsed by 18% of respondents, was related to increases in confidence. A sample response was, “The main reason was because it made me think and become more confident about myself.” The fifth topic area, endorsed by 5% of respondents were “miscellaneous” responses that did appear to fit within another category. A sample response was, “To be able to express all the feelings I had.”

In comparison, a minority (18%) of participants responded to the question, “if you did not feel better about your body image following the program, what was the main reason.” Responses to this question appeared to cluster into two major topic areas, similar to Study 1. The first topic area, endorsed by 67% of respondents, was that the information was not persuasive. Sample responses include, “I knew the facts, nothing had changed,” and “I had a good body image before.” The second topic area, endorsed by 33% of respondents, seemed to reflect the continued perception of thin-ideal pressure. Sample responses include, “I still felt the need to be skinny,” and “still pressure of society.”

Unexpected Changes in School Culture

Several unexpected results during were observed Study 2. These findings can generally be classified under issues of “school culture,” and include positive changes seen on the HPA campus during and after the course of the program, as well as negative school policies and practices that were identified and addressed as a result of discussions in intervention groups. Positive changes on campus included the presence of post-it notes on mirrors throughout campus with positive body image messages e.g., “you look beautiful, stop worrying,” the formation of a “Body Image Club” to create a structured group to continue to work together to promote positive body image on campus, and the organization of a school-wide assembly presentation on positive body image. A final substantial positive change was the addition of a body image program for boys to parallel the girls’ dissonance-based intervention. The lead author worked with the school counselors to create a brief intervention for boys that focused both on male body image pressures as well as girls’ body image concerns. Further, two school policies and practices that were perceived as negative were identified and addressed during the course of the study. First, the lead author was contacted by a group of peer leaders asking for assistance in addressing the “School Olympics” policy of publicly weighing students before competing in a tug-of-war. Second, after receiving complaints from peer leaders about overhearing specific teachers and coaches making comments that were perceived as negative about weight, shape, and food, the school counselor asked the UH team to give talks to school staff and coaches on body image and healthy eating in adolescents.

Study 2 Discussion

The purpose of Study 2 was to continue to evaluate the feasibility and acceptability of a dissonance-based prevention program delivered by peer leaders in a high school setting and to begin evaluating the programs effectiveness in reducing eating disorder risk factors. The dissonance program was adopted by the participating school, and the entire project, from recruitment to evaluation, was incorporated into the school curriculum. The program was delivered on a mandatory basis to freshman girls within the school day. The methodology adopted by the school addressed several of the methodological limitations of Study 1 by increasing sample size and reducing dropout by requiring participation within the school day, and extending the follow-up assessment to fit with the school calendar. Each of these changes was initiated by the school and fully supported by the research staff overseeing the project. Results of Study 2 provide additional support that dissonance-based prevention can be implemented by high school peer leaders with success.

Evaluation of fidelity in Study 2 provides additional support for the hypothesis that high school peer leaders can deliver a dissonance-based intervention with a high level of adherence to prescribed content. Adherence to major components of the intervention, as delivered by peer leader teams of three or four high school girls, ranged from 74% to 97% between the two intervention sessions. Adherence in the current study was similar to Study 1, although the range of adherence was slightly larger. This range may reflect the fact that the program was provided on a mandatory basis, and therefore, some participants may not have been as motivated to engage with session content, making groups more difficult to facilitate. Informal feedback from peer leaders

suggested that compared to Study 1, participants in Study 2 were quieter at times and perceived as somewhat harder to engage in the intervention content overall. This may reflect the mandatory nature of participation and the age difference between peer leaders (high school juniors and seniors) and group members (high school freshmen).

Further, feedback following Study 2 provides additional evidence that this intervention is perceived positively when delivered in this manner. Formal feedback on the program suggested that all participants enjoyed the program, and nearly all participants reported they learned new information from the program. The percentage of participants who reported learning new information was slightly lower compared to Study 1, and is unsurprising given the mandatory nature of the program. It is promising, however, that all participants reported enjoying the program at least “a little” or more. In addition, similar to Study 1, most participants reported that the program made them want to change their feelings about pursuing the thin-ideal. A majority of participants reported that after the intervention and through follow-up, they applied the program through thinking about it, incorporating messages into their life, and talking to others about it. Ratings of each of these items were similar to Study 1. Informal feedback from key staff and administration involved in the program was positive overall, and the unexpected changes observed within the school’s culture suggest that the students were incorporating the messages of the intervention far beyond the two-session program. Peer leaders, who seemed to take pride in their role as body image leaders on campus, initiated most of these changes, such as the creation of the Body Image Club on campus.

Importantly, the evaluation of outcomes in Study 2 provides quantitative support for the hypothesis that peer-delivered dissonance-based prevention can reduce eating

disorder risk factors among high school girls. Specifically, the larger sample size in Study 2 allowed for a statistical test of outcomes, and results revealed that post-intervention, participants who received the program reduced all eating disorder risk factors compared to controls. Results for body dissatisfaction, eating pathology, and dietary restraint were sustained for all participants at the three-month follow-up. While these results are promising, there was variability in effects within some constructs depending on measurement instrument, and therefore, these results are modest compared to outcomes found in other effectiveness trials, in particular those utilizing peer delivery (e.g., Becker et al., 2006, 2008, 2010). However, the overall goal of Study 2 was to continue to evaluate the peer-delivered dissonance program to see if this delivery method warrants further study with this population. Results of this study indicate that additional research using more rigorous methodology should continue to assess the effectiveness of peer-led dissonance prevention in high school settings.

General Discussion

Summary of Results

The purpose of this research was to assess the viability of a dissonance-based eating disorder prevention program when delivered by peer leaders in a high school setting. Through two initial quasi-experimental studies, the current research adds to the growing evidence base for effectiveness and implementation research on dissonance-based eating disorder prevention. Taken together, results from an elective initial study of the program's feasibility and acceptability and a second trial evaluating the outcome in mandatory program implementation within the school's curriculum suggest that peer-delivered dissonance-based prevention may be effective in the high school setting, and

warrants further research. This research was conducted within the framework of community-partnership research, and evaluation and implementation were conducted in collaboration with the participating school. This is the first study of its kind to assess the peer-delivered dissonance program within a high school population.

Results from these two studies demonstrate that peer leaders delivered the dissonance-based program with a high level of adherence to an intervention manual tailored specifically for this age group. In addition, feedback indicated that the program was viewed as highly acceptable and impactful by students involved in the program. Additional evidence to support of the positive views of the program was observed through changes within the school culture. Further, key staff members and administration within the school viewed the program positively and have requested continued implementation within the school's curriculum. Most importantly, the effects of the dissonance program on eating disorder risk factors were positive. Study 2 demonstrated that thin-ideal internalization, body dissatisfaction, eating pathology, and dietary restraint were reduced post-intervention compared to waitlist control. Follow-up assessment revealed sustained short-term changes in body dissatisfaction, eating pathology, and dietary restraint, which converges with results of previous effectiveness trials of dissonance-based prevention. Unlike previous trials, however, Study 2 failed to demonstrate sustained change in thin-ideal internalization. Overall, this pattern of results provides initial evidence for the potential success of peer-led implementation in the high school setting.

The current studies yielded significant within-group effect sizes that were small to medium in magnitude, suggesting that results may be clinically meaningful. Overall,

significant effect sizes in the current studies post-intervention are within the range of those found in other effectiveness trials of dissonance-based prevention (see Table 7 for a comparison of effects sizes in the current studies with previous effectiveness studies). More importantly, effect sizes for constructs that showed significant and sustained reductions through follow-up, including body dissatisfaction, eating pathology, and dietary restraint (as measured with the BSQ and EDEQ) are similar to effect sizes found in other peer-led studies. Specifically, significant effect sizes for body dissatisfaction are slightly larger than effects found in early peer-led trials (Becker et al., 2006, 2008), and significant effect sizes for eating pathology and dietary restraint are slightly smaller (Becker et al., 2008, 2010). Overall, effect sizes are smaller when compared to the effectiveness trial conducted by Stice and colleagues (2009), which may reflect the fact that their research was conducted with a high-risk population, which tends to yield higher effect sizes overall (Stice et al., 2007). It is encouraging that this intervention produced several small but significant effects through a three-month follow-up that have been found across effectiveness studies (e.g., Becker et al., 2006, 2008, 2010, Stice et al., 2009). This research adds to the evidence base for dissonance-based prevention using non-professional providers.

It is particularly encouraging that the peer-delivered intervention had a positive effect on participant levels of body dissatisfaction. Recent research has pointed to the specific importance of body dissatisfaction in the development of eating and weight disturbances. An 8-year prospective study found that body dissatisfaction was the most powerful predictor of future onset of threshold and sub-threshold eating disorders (Stice, Marti, & Durant, 2011). Specifically, higher levels of body dissatisfaction led to a 4.0-

fold increased incidence of eating disorder onset. For those high in body dissatisfaction, greater depressive symptoms were also associated with higher incidence of eating disorder onset (a 2.9-fold increased incidence). For those who reported lower body dissatisfaction but also reported concurrent dieting, incidence of eating disorder onset was increased 3.6-fold. It is also promising that reductions in eating pathology and dietary restraint were observed over time (as measured with the EDEQ) as demonstrated in Study 2. A recent review suggests that elevated body dissatisfaction and high dietary restraint may represent prodromal stages of eating disorder development (Stice, Ng, & Shaw, 2010). This highlights the importance of reducing body dissatisfaction and dieting in prevention studies in order to prevent future eating disturbances. Further, prevention programs that produce changes in dieting behaviors may have an impact on later weight control. A recent longitudinal study of adolescent eating behaviors found that dieting and unhealthy weight control behaviors, in particular those that are practiced over a period of time, predicted 10-year increases in BMI (Neumark-Sztainer, Wall, Story, & Standish, 2011). While additional research is needed to determine if the reductions in risk factors found in the current studies would persist over a longer-term follow-up, especially compared to a longer-term waitlist control group, these findings suggest that peer implementation may have a positive effect on several key eating disorder risk factors, and possibly on the most important overall variable, eating pathology.

Despite the positive nature of these preliminary findings, the current results should be interpreted with some caution, given that prior efficacy studies of dissonance-based prevention have found more robust and longer-term reductions in numerous eating disorder risk factors (e.g., Stice et al., 2006, 2008; Becker et al., 2005). Further,

effectiveness studies, including those utilizing peer-led prevention (e.g., Becker et al., 2006, 2008, 2010) have consistently found reductions in thin-ideal internalization that was not observed in the current research. It was unexpected that the changes in thin-ideal internalization elicited by the intervention in Study 2 were not sustained, whereas reductions in some other risk factors were maintained. This is inconsistent with the theoretical model for the dissonance-based intervention, which posits that dissonance-based reductions in thin-ideal internalization will result in subsequent changes in other eating disorder risk factors, and this pathway of mediation has been supported empirically (Stice, Presnell, Gau, & Shaw, 2007). Interestingly, the one effectiveness trial conducted with high school students to date (Stice et al., 2009) also found that changes in thin-ideal internalization that were present post-intervention were not sustained through six-month or one-year follow-up. In their study, the dissonance program was delivered by school staff who underwent a brief training.

The lack of sustained change in internalization in the current research may be explained in several ways. First, it is possible that other factors had a greater impact on the changes that occurred during the intervention. Open-ended feedback following the intervention regarding reasons for improved body image revealed that participants perceived multiple reasons for their positive change, including the group experience which normalized body image discontent within their peers, acceptance of appearance, weight, and shape, and increases in confidence following the program. Specific responses that were related to rejecting the thin-ideal were endorsed by only 20% of participants in Study 2. Therefore, it is possible that these or other unmeasured factors had a greater role in eliciting attitudinal and behavioral changes over time.

A second possibility, proposed by Stice and colleagues (2007, 2009), is that the most important shifts in internalization from a mediation standpoint are those that occur during the intervention. Therefore, reduction in internalization post-intervention is the most potent predictor of changes in other outcomes, regardless of maintenance of internalization changes over the longer-term. This may be true for the current study, and exploratory regression analyses were conducted within Study 2 to assess this possibility. Results revealed that pre-to-post changes in internalization as measured by the IBSS-R, but not the SATAQ-3, predicted lower total body dissatisfaction, eating pathology, and dietary restraint at post-intervention and follow-up (measured by the EDEQ; all $p < .05$). This lends support to the notion that dissonance was experienced by group members, reflected in the short-term reduction in belief in the thin-ideal, and the reduction in this construct predicted greater changes in other risk factors over time. Future research should continue to explore mediators of effects in order to better understand how changes in internalization may or may not be important in the short- and long-term within dissonance-based prevention.

A third explanation for the lack of sustained changes in internalization is that the amount of dissonance elicited by the program was low compared to previous trials. This may indicate that high school peer leaders are not as effective at delivering the dissonance-based intervention compared to professionals (e.g., Stice et al., 2006, 2008; Becker et al., 2005) and college-age peer leaders (Becker et al., 2006, 2008, 2010). Specifically, it is possible that the intervention as it was provided did not offer as much opportunity to critique the thin-ideal compared to how it was intended. A qualitative review of audio recordings suggested that peer leaders for one group in Study 2 did not

do a thorough job setting up the thin-ideal/healthy-ideal contrast compared to how this section is usually covered; failure to set up this contrast may have made later thin-ideal critiques less potent for the group. It is possible that this construct may be hard to convey for some high school-aged peer leaders, particularly if group members are not participating actively in the intervention. Other peer leader teams did appear to complete this section competently, however, although it is difficult to determine exactly how participants perceived these sections.

A fourth possibility is that the changes in thin-ideal internalization post-intervention were a result of demand characteristics, as the focus of the entire intervention was on rejecting the thin-ideal, and participants may have felt pressured to report that they did not endorse these attitudes immediately after they received the intervention. This demand may have subsided somewhat by follow-up, allowing participants to report more truthful beliefs about thin-ideal attractiveness and internalization of societal messages. However, most measures used in the studies with face validity did not seem to suffer from demand in the same manner, and so this explanation appears to be the least likely.

The group by time interaction effect on SATAQ-3 scores in Study 2 suggests there were differences between groups in internalization changes, where participants who received the intervention in active groups reduced this construct to a greater degree than participants who received the intervention in waitlist groups. This difference could be due to systematic and unmeasured variance between these groups, which is possible since they were not randomly assigned. However, groups did not significantly differ from one other at baseline on these and other highly correlated constructs, and it is more likely that

difference are due to inconsistent intervention implementation between active groups and intervention groups. A high level of adherence to the adapted intervention manual was observed in both studies, yet groups run as part of the waitlist had slightly lower mean adherence overall and greater standard deviations compared to groups run in the active cohort. For example, one waitlist group in Study 2 had the lowest adherence overall across both studies for both Session 1 (74%) and Session 2 (82%). Further, in both studies, within-group effect sizes for groups run within the waitlist were slightly smaller compared to active groups (approximately 0.10 lower). Appendix M includes Table 10, which reports adherence rating information and average effect sizes by peer leader group for both studies. The smaller effects observed in waitlist groups may have been due to reduced adherence to the intervention content. Exploratory regression analyses from Study 2 data revealed that higher session adherence predicted greater reduction in SATAQ-3 scores post-intervention ($p < .05$). Adherence did not significantly predict any changes in other measures at any time point. When applied to the theoretical model for this program, this would suggest that groups lower in adherence produced fewer changes in thin-ideal internalization (as measured with the SATAQ-3), and subsequently, smaller reductions in other risk factors overall.

There are two potential explanations for the variation in adherence within these studies. First, peer leader teams could have been lower on adherence because of external factors, such as difficult or large groups. For example, the peer leader team who had the lowest adherence in Study 1 was also the largest group, with 12 members (this also happened to be the waitlist group). A second possibility is that peer leader teams could have delivered the program with less fidelity as time passed. Active groups were

conducted shortly after peer leader training (two weeks later in Study 1 and three weeks later in Study 2), and waitlist groups were run further out from peer leader training (four weeks after training in Study 1 and six weeks after training in Study 2). Waitlist groups in Study 2 had lower adherence, even when sessions were conducted by the same peer leader teams. This may indicate a drift from the intervention manual when groups were conducted further from peer leader training. Although peer leaders were contacted to ask if a booster session were needed between active and waitlist implementations, all peer leaders declined this booster.

It is important to consider whether the intervention adherence in the current study is acceptable. A comparison of adherence with previous effectiveness studies is difficult, as most studies do not report these data. Two recent studies by Stice and colleagues (McMillan et al., 2011, Stice et al., 2009) report treatment fidelity rated on a 1-10 scale, from 1 = *No adherence; the section was skipped* to 10 = *Perfect; all material in the section was presented as written*. Implementation fidelity for sessions delivered by professionals (McMillan et al., 2011) ranged from 5-8 with a mean rating of 7.1. Implementation fidelity for sessions delivered by high school staff members (Stice et al., 2009) ranged from 2-10 with a mean rating of 6.9. While the different scales used to rate adherence make direct comparisons impossible, overall, adherence in the current studies seems to be comparable. However, a measure of peer-leader competence was not included in the current research projects, and it is not known whether sections that were covered were done so with competence. A review of session audio recordings revealed that there may have been small but observable differences between peer leader teams in how competently the intervention was delivered, and that groups conducted within the

waitlist may have been conducted with less competence. For example, two peer leader teams (the waitlist team in Study 1, and one of three waitlist teams in Study 2) conducted groups that were quieter and went through sections faster compared to others. This may have reflected a lack of competence on the part of peer leaders, or that they were faced with a particularly challenging group dynamic. These differences may also be related to differences in outcomes between the active and waitlist groups.

It is necessary to highlight that significant effects were not found for all measures used to assess constructs in the current studies (e.g., differential results with EAT-26 and EDEQ in Study 2). There are several potential explanations for this pattern of findings in the current research. It is possible that measurement error may have contributed to some of the unexpected patterns in the results. For example, the lack of significant difference between the waitlist and active group in Study 2 for constructs measured with the EDEQ seem to be driven by a decrease in the waitlist group. Following the intervention, body dissatisfaction, eating pathology, and restraint as measured by the EDEQ were all significantly lower and no differences were found between waitlist and control groups. The majority of EDEQ items are designed to assess the frequency of eating disorder-related behaviors over a one-month period, and it is possible that changing the time frame to one week resulted in measurement error represented as decreases in symptoms. Reduction in the waitlist may be due to a measurement effect or regression to the mean, which is more likely to affect overall mean scores in small samples. It was also surprising that post-intervention reductions in eating pathology observed in the EAT-26 in Study 2 were not sustained through follow-up, whereas this construct as measured by the EDEQ was significantly lowered through follow-up. The two measures were highly

and significantly correlated at all time points, although the correlation was slightly weaker at follow-up ($r = 0.85$ for baseline, $r = 0.82$ post-intervention, $r = 0.75$). It is unclear why there is a discrepancy between these two measures and their estimates of psychopathology in the current sample. One potential explanation is that the EAT-26 was not a reliable measure of eating disorder pathology in the current studies. Many items in the EAT-26 were not highly correlated with the total scale. While items with item-total correlations lower than 0.2 were removed, many additional items (6 items each in Study 1 and 2) had item-total correlations between 0.2 and 0.5. Although the internal consistency as measured with cronbach's alpha was good, the scale may have included variance due to poor items that were not measuring the intended construct. Changes resulting from this scale may not represent actual changes in the construct.

Limitations

There are several significant limitations to the current study that should be noted. Several of these limitations are due to the nature of the collaboration with the participating high school and a commitment to community-partnership research (Becker et al., 2009) and utilizing effectiveness research methods (Marchand, Stice, Rohde, & Becker, 2011). One such limitation is the lack of a true experimental design with random allocation of participants to groups. A second, related limitation is the lack of long-term follow-up with a waitlist control. These are significant design flaws, although the primary goal of the current research was to work with the participating school to create a feasible implementation strategy that would be sustainable in the long-term. While meta-analyses suggest that effect sizes are not significantly different in trials that use random assignment to group compared to those that do not (Stice et al., 2004), future research

should try to prioritize random assignment to groups and at a minimum, utilize longer-term (preferably controlled) follow-up to assess for any unmeasured factors due to participants or time that may have influenced the results in the current studies.

A third limitation in the current studies is the small sample size. In effectiveness research, small samples can lead to smaller effects due to the variability of participants and providers (Marchand et al., 2011). While positive effects were suggested in the current studies, even with the small samples, future research should increase sample size to replicate the current findings and better understand the pattern of effects, in particular the surprising changes in internalization over time found in these studies that differs from previous research. A fourth limitation of the current studies is that the results may be limited in generalizability, given that the participating school was small, private, rural, and ethnically diverse. Changes in school culture that were detected in the current research may have contributed to overall effects, and it is unclear if the results from this program would generalize to larger schools. Further, the ethnic diversity of the sample may also preclude generalizations to other populations with different ethnic compositions. Research has shown similar effects of the dissonance program for Caucasian, Asian, and Latino participants (Rodriguez, Marchand, Ng, & Stice, 2008). The current study did not have adequate power to examine the specific intervention effects for participants of different ethnicities, and it is recommended that future research expand to other populations to examine the effectiveness of peer-delivered intervention within public schools and with diverse individuals.

Lessons Learned and Implications for Eating Disorder Prevention

The current research adds to the effectiveness research base for dissonance-based eating disorder prevention. While these two initial trials suggest that dissonance-based eating disorder prevention may be effective when delivered using high-school aged peer leaders, it is clear that more research is needed. Several “lessons learned” while conducting this research may help to guide future researchers who consider using high school students to implement dissonance-based eating disorder prevention. The first lesson learned was the necessity of ongoing negotiation and compromise in community-participatory research. A major strength of this research was the focus on creating a sustainable and acceptable program within a school community. It has been argued that partnering with communities in this way is essential to assist in disseminating evidence-based programs (Becker et al., 2009). The collaboration with the participating school in the current studies appears to be a successful example of this process, as the school plans to continue to implement the program using peer leaders within freshman foundation courses for the foreseeable future. The tradeoff was, however, a compromise on certain aspects of research design such as randomizing participants to groups. While it is encouraging that some significant reductions in risk factors were demonstrated overall, it is recommended that future trials continue to utilize more rigorous methodology to evaluate program effects, including a longer-term follow-up to assess the sustainability of changes.

A second lesson learned was the necessity of providing structure and supervision when implementing a new program within a high school setting. The high rate of drop out in Study 1 highlighted the difficulty retaining group members when the program was

delivered after school in an academic environment with many competing after-school obligations. For example, several group members elected to attend an extra credit movie offered in one of their classes on the same evening Session 2 of their group was held. The lesson learned was that this program may benefit from the structure of mandatory attendance within the school day and school curriculum, where an adult is primarily responsible for attendance and accountability of students. Further, the intervention was fairly resource-intensive in terms of training hours and it is recommended that future research have full buy-in from schools to allocate such resources to the project before beginning.

Related to this, a third lesson learned was the necessity to closely supervise and support peer leaders in this age group. While the current research demonstrated that high school-aged peers can be trained to adhere to the intervention manual at an acceptable rate, future studies should more closely supervise peer leader teams in an attempt to identify sections that may be difficult to implement. Mandatory booster sessions are also recommended to increase program adherence if there will be a considerable length of time between training and implementation. It is further recommend that peer-delivered programs with this age group should keep group sizes small to improve group cohesion and manageability. Finally, future studies using youth peer leaders should assess facilitator competence to try to identify areas for improvement in facilitator skill and adherence within this age group. It may also be worth considering an alternate combination of intervention providers such as including one adult as a primary leader and several peer leaders who lead activities within sessions.

A fourth lesson learned points to the promise of expanding the scope of prevention research conducted within a contained community such as a high school campus. The unexpected findings in Study 2 that pointed to subtle shifts within the school culture as a result of the intervention highlight the potential for future research that addresses school culture on a wider basis, by including school staff, coaches, and administration in prevention efforts aimed at students.

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Appendix A.

*Adherence Checklists***Session 1 Adherence Checklist**

Rater: _____

Date: _____

Group #: _____

INSTRUCTIONS:

- Please check the box next to each item if the component was covered by peer leaders.
- Please leave the box unchecked if the item was not covered.

SUGGESTIONS:

- You may want to reference your copy of the Peer Leader Guide as you rate components.
- It is okay if the peer leaders don't read from the Guide word for word.
- Use your judgment and do not mark an item as "covered" if leaders deviate so far from the script that the meaning is not clear.

Session 1 Components
<p><u>Part 1: Introductions</u></p> <p><input type="checkbox"/> Peer leader introductions (why each chose to be leaders)</p> <p><input type="checkbox"/> Group member introductions (1 thing no one knows)</p>
<p><u>Part 2: Icebreakers</u></p> <p><input type="checkbox"/> Everyone share body image pet peeve</p>
<p><u>Part 3: Voluntary Commitment & Overview</u></p> <p><input type="checkbox"/> Asked group members to each verbally agree to participate</p> <p><input type="checkbox"/> Reviewed content of 2 sessions</p> <p><input type="checkbox"/> Reviewed confidentiality agreement</p>
<p><u>Part 4: Definition & Origin of the Thin-Ideal</u></p> <p><input type="checkbox"/> Description of ideal woman (what are we told the perfect woman looks like...)</p> <p><input type="checkbox"/> Obtained details on specific body parts (e.g., how thin is she? How flat is her stomach?)</p> <p><input type="checkbox"/> Read over features of this ideal woman (e.g., this tall, super thin, flat-stomached woman...)</p> <p><input type="checkbox"/> Labeled this "look" as the "thin-ideal"</p> <p><input type="checkbox"/> Contrasted thin-ideal with healthy ideal</p> <p><input type="checkbox"/> Emphasized that most of us, when at a healthy weight, are not close to the thin-ideal</p>

Asked about thin-ideal:

- Does group know if there have been changes in the gold standard of attractiveness over time?
- What are the origins of thin-ideal?
- How is the thin-ideal passed along?
- How do the media perpetuate the thin-ideal?
- How much touching up do magazines do?
- How it feels to know the most beautiful women are touched up?
- Do photo editors meet the thin-ideal standard themselves?

Asked how messages from different sources affect us:

- From the media
- From different cultures
- From peers
- From dating partners
- From parents

Challenged accuracy of thin-ideal by asking:

- What does society tell us will happen if we look like the thin-ideal?
- Will achieving the thin-ideal guarantee those things will happen?
- What is so perfect about the thin-ideal?
- Is it really ideal?

Part 5: Costs associated with pursuing the thin-ideal

- Introduced costs exercise (costs to individual girls and to HPA for pursuing the thin-ideal)
- Gave group time to fill out “costs” worksheet

Reviewed costs exercise:

- Asked about feelings as costs were recorded
- Asked group members to each share 1 individual cost from their worksheet

Discussed specific costs in different areas:

- Self-esteem costs
- Academic/student life costs
- Health Costs
- Quality of Life Costs
- HPA/school costs
- Society costs
- Asked: Who benefits from society’s pursuit of the thin-ideal?

Asked hypothetical questions:

- How many of us or supermodels making a fortune?
- Anyone getting rich selling diet pills?
- Anyone invented exercise equipment or diet soda?
- Anyone an elite fashion designer?

Asked questions about costs vs. benefits:

- Are we part of the group that is benefiting?
- Given the costs, is the thin-ideal realistically obtainable for the average person?
- Is it worth it for the average person?
- Does it make sense for the average woman to pursue the thin-ideal?
- Asked group members to each provide 1 statement against pursuing the thin-ideal

Part 6: Verbal challenge Exercise

- Introduced verbal challenge exercise (responding to real life pressures to be thin)
- Gave example of pressure (friend says ideal dress size is 0)
- Example of verbal challenge/response (either peer leader or group provided)
- Emphasized verbal challenges aren't how you responded *then* but how you would *now*
- Gave another example of pressure (comparing self to thinner classmate/friend)
- Example of verbal challenge (either peer leader or group provided)
- Gave group time to fill out "verbal challenge" worksheet
- Asked group members to each share 1 example from their worksheet

Part 7: Home Exercises

- Introduced mirror exercise (look in mirror and record positive qualities)
- Gave examples of qualities to record (e.g., I like my hips, I like my legs)
- Asked group to record on "mirror exercise" worksheet
- Gave testimonial for why mirror exercise is helpful

Part 8: Session Wrap-Up

- Asked group members to each say concluding statement

Session 2 Adherence Checklist

Rater: _____

Date: _____

Group #: _____

INSTRUCTIONS:

- Please check the box next to each item if the component was covered by peer leaders.
- Please leave the box unchecked if the item was not covered.

SUGGESTIONS:

- You may want to reference your copy of the Peer Leader Guide as you rate components.
- It is okay if the peer leaders don't read from the Guide word for word.
- Use your judgment and do not mark an item as "covered" if leaders deviate so far from the script that the meaning is not clear.

Session 2 Components
<p><u>Part 1: Review of Mirror Exercise</u></p> <p><input type="checkbox"/> Asked group members to each say they are willing to participate in the session</p> <p><u>Reviewed mirror exercise by asking:</u></p> <p><input type="checkbox"/> How did it feel?</p> <p><input type="checkbox"/> Was it challenging?</p> <p><input type="checkbox"/> Why do we have a hard time saying positive things about ourselves?</p> <p><input type="checkbox"/> Asked group members to each share a positive attribute from mirror exercise</p> <p><input type="checkbox"/> Asked group members to each share a second positive attribute</p> <p><input type="checkbox"/> Asked: Why is this exercise helpful?</p>
<p><u>Part 2: Role-Plays to discourage the Pursuit of the Thin-Ideal</u></p> <p><input type="checkbox"/> Introduced role-play exercise (peer leaders will play girls obsessed with thin-ideal)</p> <p><input type="checkbox"/> Introduced Role Play 1: high protein dieter who wants best abs</p> <p><input type="checkbox"/> Introduced Role Play 2: over-exerciser</p> <p><input type="checkbox"/> Introduced Role Play 3: severe restrictor/1 meal per day for boyfriend</p> <p><u>To the best you can tell from the recording:</u></p> <p><input type="checkbox"/> Split group members into 3 groups</p> <p><input type="checkbox"/> Allowed time to rehearse and record responses on "Role-play" worksheet</p> <p><input type="checkbox"/> Role plays took place</p> <p><u>When back together as a big group:</u></p> <p><input type="checkbox"/> Asked group for reaction</p> <p><input type="checkbox"/> Asked how it felt to hear leaders talk that way</p>

Part 3: Challenging Fat Talk

- Asked: Can anyone think of things we may do on an everyday basis to promote the thin-ideal that we may not realize we are doing?
- Referred group to “Fat Talk List” worksheet
- Gave group time to read over list

Discussed Fat Talk list by asking:

- How do the statements perpetuate the thin-ideal?
- Do comments have to be negative to promote the thin-ideal?
- What are some things you could do or say to challenge this talk?
- How would your feelings toward your body change if you stopped talking this way?
- If you stopped saying statements on list, how would it affect others?
- How can we ask a high school work to get rid of fat talk?

Part 4: Top-10 List

- Introduced Top-10 list (things to avoid, say, do, or learn to battle the thin-ideal)
- Gave group time to fill out “Top-10 List” worksheet
- Asked group members to each share 1 idea from worksheet (body activism)
- Asked more broadly for ideas about what HPA as a high school can do (HPA body activism)
- Asked about barriers to HPA body activism
- Asked about solutions to barriers
- Asked: Which should we start implementing at HPA immediately?

Part 5: Self-Affirmation Exercise

- Introduced self-affirmation exercise (additional ways to talk positively about your body)
- Referred group to “Self-Affirmation” worksheet
- Read over 5 self-affirmation exercises
- Asked for other ideas
- Asked group to choose 1 idea to implement in the next week
- Asked group members to each share which exercise they chose

Part 6: Session Wrap-Up

- Asked group members to each share 1 last thing

Appendix B

Questions Assessing Program Perception		Study 1 Responses		Study 2 Responses	
		<i>n</i>	%	<i>n</i>	%
How much did you enjoy the program?	Very much	4	22.2	13	26.0
	A lot	7	38.9	17	34.0
	A medium amount	6	33.3	17	34.0
	A little	1	5.6	3	6.0
	Not at All	0	0.0	0	0.0
How much did the program teach you new information?	Very much	4	22.2	13	26.0
	A lot	9	50.0	21	42.0
	A medium amount	4	22.2	13	26.0
	A Little	1	5.6	1	2.0
	Not at all	0	0.0	2	4.0
Questions Assessing Change in Attitudes and Beliefs		Study 1 Responses		Study 2 Responses	
		<i>n</i>	%	<i>n</i>	%
How much did the program change your feelings about pursuing the thin-ideal?	Very Much	2	11.1	6	12.0
	A lot	5	27.8	19	38.0
	A medium amount	10	55.6	14	28.0
	A little	0	0.0	8	16.0
	Not at All	1	5.6	3	6.0
How much did the program make you want to pursue the thin-ideal less or stop pursuing it altogether?	Very Much	0	0.0	9	18.0
	A lot	7	38.9	15	30.0
	A medium amount	8	44.4	14	28.0
	A little	2	11.1	9	18.0
	Not at All	1	5.6	3	6.0
How much did the program make you want to pursue the thin-ideal <u>more</u> ?	Very Much	1	5.6	1	2.0
	A lot	0	0.0	4	8.0
	A medium amount	6	33.3	9	18.0
	A little	3	16.7	5	10.0
	Not at All	8	44.4	31	62.0
How much did you feel influenced by the <u>group</u> to change your beliefs about the thin-ideal?	Very Much	4	22.2	7	14.0
	A lot	6	33.3	9	18.0
	A medium amount	6	33.3	18	36.0
	A little	1	5.6	12	24.0
	Not at All	1	5.6	4	8.0
How much did you feel influenced by your <u>self</u> to change your beliefs about the thin-ideal?	Very Much	3	16.7	5	10.0
	A lot	8	44.4	14	28.0
	A medium amount	6	33.3	17	34.0
	A little	1	5.6	11	22.0
	Not at All	0	0.0	3	6.0

Questions Assessing Program Application	Response	Study 1 Responses		Study 2 Responses	
		<i>n</i>	%	<i>n</i>	%
How often have you incorporated things you learned in the program into your life? (post-intervention)	All the time	0	0.0	0	0.0
	A lot	4	22.2	6	12.0
	A medium amount	8	44.4	30	60.0
	A little	5	27.8	13	26.0
	Not at All	1	5.6	1	2.0
How often have you incorporated things you learned in the program into your life? (follow-up)	All the time	1	2.3	1	2.1
	A lot	5	11.6	5	10.6
	A medium amount	4	39.5	19	40.4
	A little	0	0.0	14	29.8
	Not at All	3	23.1	8	17.1
How often do you think about things you learned in the program? (post-intervention)	All the time	1	5.6	0	0.0
	A lot	7	38.9	10	20.0
	A medium amount	8	44.4	23	46.0
	A little	2	11.1	15	30.0
	Not at All	0	0.0	2	4.0
How often do you think about things you learned in the program? (follow-up)	All the time	0	0.0	1	2.2
	A lot	8	61.5	7	15.2
	A medium amount	2	15.4	12	26.1
	A little	1	7.7	18	39.1
	Not at All	2	15.4	8	17.4
How often do you talk about the program with someone else? (post-intervention)	All the time	1	5.6	0	0.0
	A lot	0	0.0	6	12.2
	A medium amount	5	27.8	16	32.7
	A little	10	55.6	21	42.9
	Not at All	2	11.1	6	12.2
How often do you talk about the program with someone else? (follow-up)	All the time	0	0.0	0	0
	A lot	0	0.0	3	6.7
	A medium amount	7	53.8	6	13.3
	A little	5	38.5	15	33.3
	Not at All	1	7.7	21	46.7

Appendix C

Table 9 <i>Study 1 and 2 Post-intervention Responses to Open-ended Feedback Questions</i>		
Question: If you felt better about your body image following the program, what was the reason?		
Topic Area	Study 1 Responses	Study 2 Responses
“Normalizing”	<ul style="list-style-type: none"> • Because other girls feel the same as me and have similar problems • That everyone else is feeling the same way, and nobody would ever judge us by the way we look. • Talking with the people in the group, not just talking with your friends different faces • That others go through the same stuff • I know now that there are so many other people who don't like their bodies but what they don't realize is that there are others who are starving out there • The fact that they way I felt about my body and myself my friends had similar feelings too 	<ul style="list-style-type: none"> • I realized that everyone has flaws • I just related to my peers a lot and it felt good • Feeling the support of the other girls in the group. They are loving and non-judgmental • The main reason I feel better is because I know that other people are feeling the same way I am • Just knowing that other girls have problems too • Being able to talk about with other girls that go through the same thing • I felt better because I know that everyone feels the same way at a point but I don't have to try hard to be perfect • Because I realized I'm not the only one going through these kind of things and I am now better equipped to help myself and others • Because I found out mostly all girls are insecure too • I found that everyone else is subconscious so I shouldn't worry about what other people think because they are just worrying about themselves • Because I know its not just me • Others have problems as well • To know that others think like me • Understanding everyone is different

Table 9 (Continued)		
<i>Study 1 and 2 Post-intervention Responses to Open-ended Feedback Questions</i>		
Topic Area	Study 1 Responses	Study 2 Responses
“Acceptance”	<ul style="list-style-type: none"> • Because its easier to accept yourself for who you are than to change yourself & sometimes impossible to change • Because this is how I am and everyone is better off • Because beauty is intangible and these girls just reaffirmed that • That I accepted what I didn't like • I'm still me, regardless of size • For me it was because I felt more comfortable being myself • I felt like I should appreciate what type of body I have • I felt better about my body image after this program because I learned that not everyone should feel bad about their body they should love who they are • Because everyone should love their body 	<ul style="list-style-type: none"> • I was able to accept the better points of my body • Now I know I am perfect the way I am and everyone should love me for me • Because I'm pretty in my own way and that I shouldn't compare myself to other girls • I guess I did because we learned why we're all beautiful • Everyone is different in their own way • I felt better because everyone has their own body • Well to accept myself for what I am and not compare myself with others • Everyone had different ideal of beauty, and all I had to do was accept my own and body • The main reason is that it taught me that its okay to be the way you are, and we should be comfortable with your body • Is to stop worrying about myself gaining weight • This program taught me to think positive
“Rejecting the Thin-ideal”	<ul style="list-style-type: none"> • I'm not being pressured to look perfect like the people in magazines and its nice to know that they are all normal people and magazines make them something they are not. • I learned about the thin-ideal and what makes people work towards it 	<ul style="list-style-type: none"> • I just learned the facts about all those beautiful people we see in the media and the effects that chasing the thin-ideal can have • Not to deal with the thin-ideal • A lot of people are resisting the thin-ideal • Because I learned that the "thin-ideal" is not really realistic to most average people • The main reason was that I realized that the thin-ideal is impossible to achieve • I learned the thin-ideal is impossible • We don't need to look like girls in magazines • To say its okay to not look like a model • I learned that the average women is a size 12 dress

Table 9 (Continued)		
<i>Study 1 and 2 Post-intervention Responses to Open-ended Feedback Questions</i>		
Topic Area	Study 1 Responses	Study 2 Responses
“Increased Confidence”	<i>No responses were classified under this theme</i>	<ul style="list-style-type: none"> • Confidence • Getting more self-confident • I felt more confident about how I look • More confident • Feel more confident about myself • The main reason was because it made me think and become more confident about myself • I feel more confident about myself • Because I can feel good about myself now and be proud of who I am
“Miscellaneous”	<ul style="list-style-type: none"> • My peer leaders • There's a lot of stuff that I didn't know before 	<ul style="list-style-type: none"> • To be able to express all the feelings I had • Not really because I didn't have a problem with body image before this • I know some comforting statistics
Question: If you <u>did</u> not feel better about your body image following the program, what was the reason?		
Topic Area	Study 1 Responses	Study 2 Responses
“Information not persuasive”	<ul style="list-style-type: none"> • I felt the same • It would be because we had a bad group of people that just didn't care. But that's not true. 	<ul style="list-style-type: none"> • I knew the facts, nothing had changed • I never felt bad to start off with • I don't care what people think of me, their either like me or don't • I had a good body image before • Nothing really changed • It made me feel like something had to be wrong with me just so you guys could tell me there's nothing wrong
“Thin-ideal pressure”	<ul style="list-style-type: none"> • Because none of the peer leaders were bigger like I am • All of our conversations were about girls who felt too overweight, or wanted to lose weight, and all of our ideals of the thin-ideal you shouldn't pursue applied to me it made me feel anorexic and I now feel more self-conscious about how I eat. I feel like I don't eat enough but am unable to eat that larger amount 	<ul style="list-style-type: none"> • It has opened my mind to being more skinny • Still pressure of society • I still felt the need to be skinny

Appendix D

Demographics Questionnaire

Please let us know some background information:

- 1) Age _____

- 2) **Year at HPA:** Freshman Sophomore Junior Senior

- 3) **Are you a:** Boarding Student Day Student

- 4) **Which of the following best describes your racial or ethnic background? (check one):**
 - Asian (e.g., Chinese, Japanese, Korean)
 - Hawaiian, Part-Hawaiian, or Pacific Islander
 - Black/African American
 - White/Caucasian
 - Other (Please specify: _____)
 - Mixed (Please specify: _____)

- 5) **In what country were you born?** _____

- 6) **What is your current height?** _____ feet _____ inches

- 7) **What is your current weight?** _____ pounds

Appendix E

The Ideal-Body Stereotype Scale-Revised (Stice, Ziemba, Margolis, & Flick, 1996)

<i>How much do you agree with these statements:</i>					
	strongly disagree	disagree	neutral	agree	strongly agree
1. Slender women are more attractive.					
2. Women who are in shape are more attractive.					
3. Tall women are more attractive.					
4. Women with toned (lean) bodies are more attractive.					
5. Shapely women are more attractive.					
6. Women with long legs are more attractive.					

Appendix F

The Sociocultural Attitudes About Appearance-Questionnaire-3 (Thompson, van den Berg, Roehrig, Guarda, & Heinberg, 2004)

<i>Please check the response that reflects your agreement with the statement:</i>					
	Definitely Disagree	Mostly Disagree	Neither Agree Nor Disagree	Mostly Agree	Definitely Agree
1. I <u>do not</u> care if my body looks like the body of people who are on TV. (G)					
2. I compare my body to the bodies of people who are on TV. (G)					
3. I would like my body to look like the models who appear in magazines. (G)					
4. I compare my appearance to the appearance of TV and movie stars. (G)					
5. I would like my body to look like the people who are in movies. (G)					
6. I <u>do not</u> compare my body to the bodies of people who appear in magazines. (G)					
7. I wish I looked like the models in music videos. (G)					
8. I compare my appearance to the appearance of people in magazines. (G)					
9. I <u>do not</u> wish to look as athletic as the people in magazines. (A)					
10. I compare my body to that of people in "good shape." (A)					
11. I wish I looked as athletic as sports stars. (A)					
12. I compare my body to that of people who are athletic. (A)					
13. I <u>do not</u> try to look like the people on TV. (G)					
14. I try to look like sports athletes. (A)					

(G) indicates items in the Internalization-General subscale

(A) indicates items in the Internalization-Athlete subscale

Appendix G

Body Shape Questionnaire (Cooper, Taylor, Cooper, & Fairburn, 1987)

<i>We would like to know how you have been feeling about your appearance over the PAST FOUR WEEKS. Please read each question and circle the appropriate number to the right.</i>						
<i>OVER THE PAST <u>FOUR WEEKS</u>:</i>						
	Never	Rarely	Sometimes	Often	Very often	Always
1. Have you been afraid that you might become fat (or fatter)?						
2. Has feeling full (e.g. after eating a large meal) made you feel fat?						
3. Has thinking about your shape interfered with your ability to concentrate (e.g. while watching television, reading, listening to conversations)?						
4. Have you imagined cutting off fleshy areas of your body?						
5. Have you felt excessively large and rounded?						
6. Have you thought that you are in the shape you are because you lack self-control?						
7. Has seeing your reflection (e.g. in a mirror or shop window) made you feel bad about your shape?						
8. Have you been particularly self-conscious about your shape when in the company of other people?						

Appendix H

Eating Attitudes Test (Garner & Garfinkel, 1979)

<i>Please choose a response for each of the following statements:</i>						
	Always	Usually	Often	Sometimes	Rarely	Never
1. I am terrified about being overweight. (D)						
2. I avoid eating when I am hungry.						
3. I find myself preoccupied with food.						
4. I have gone on eating binges where I feel that I may not be able to stop.						
5. I cut my food into small pieces.						
6. I am aware of the calorie content of foods that I eat. (D)						
7. I particularly avoid food with a high carbohydrate content (i.e. bread, rice, potatoes, etc.) (D)						
8. I feel that others would prefer if I ate more.*						
9. I vomit after I have eaten.						
10. I feel extremely guilty after eating. (D)						
11. I am preoccupied with a desire to be thinner. (D)						
12. I think about burning up calories when I exercise. (D)						
13. Other people think that I am too thin.* ⁺						
14. I am preoccupied with the thought of having fat on my body. (D)						
15. I take longer than others to eat my meals.*						
16. I avoid foods with sugar in them. (D)						
17. I eat diet foods. (D)						
18. I feel that food controls my life.						
19. I display self-control around food.*						
20. I feel that others pressure me to eat.*						
21. I give too much time and thought to food.						

22. I feel uncomfortable after eating sweets. (D)						
23. I engage in dieting behavior. (D)						
24. I like my stomach to be empty. (D)						
25. I have the impulse to vomit after meals.						
26. I enjoy trying rich new foods.* ⁺ (D)						

(D) indicates items in the EAT Dieting subscale

* indicates items that were removed in Study 1 due to unexpected negative or low item total correlations

⁺ indicates items that were removed in Study 2 due to unexpected negative or low item total correlations

Appendix I

Eating Disorder Examination Questionnaire (Fairburn & Beglin, 1994)

Questions 1 to 12: Please circle the appropriate number on the right. The questions refer to the past four weeks (28 days) only.							
On how many of the past 28 days...	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
1. Have you been deliberately <u>trying</u> to limit the amount of food you eat to influence your shape or weight (whether or not you have succeeded)? (R)							
2. Have you gone for long periods of time (8 waking hours or more) without eating anything at all in order to influence your shape and weight? (R)							
3. Have you <u>tried</u> to exclude from your diet any foods that you like in order to influence your shape or weight (whether or not you have succeeded)? (R)							
4. Have you <u>tried</u> to follow definite rules regarding your eating (for example, a calorie limit) in order to influence your shape or weight (whether or not you have succeeded)? (R)							
5. Have you had a definite desire to have an <u>empty</u> stomach with the aim of influencing your shape or weight? (R)							
6. Have you had a definite desire to have a <u>totally flat</u> stomach? (SC)							
7. Has thinking about <u>shape or weight</u> made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)? (WC/SC)							

8. Have you had a definite fear that you might gain weight? (WC)							
9. Have you felt fat? (SC)							
10. Have you had a strong desire to lose weight? (WC)							

Questions 13 to 18: Please fill in the appropriate number on the line on the right. Remember that the questions only refer to the past four weeks (28 days).

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

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

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

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

14. Over the past 28 days, how many times have you made yourself sick (vomit) as a means of controlling your shape or weight? _____

15. Over the past 28 days, how many times have you taken laxatives as a means of controlling your shape or weight? _____

16. Over the past 28 days, how many times have you exercised in a “driven” or “compulsive” way as a means of controlling your weight, shape or amount of fat, or to burn off calories..... _____

Questions 17 to 23: Please circle the appropriate number on the right. Remember that the questions only refer to the past four weeks (28 days).

Over the past 28 days...	Not at all	Slightly	Moderately	Markedly			
17. Has your <u>weight</u> influenced how you think about (judge) yourself as a person? (WC)	0	1	2	3	4	5	6
18. Has your <u>shape</u> influenced how you think about (judge) yourself as a person? (SC)	0	1	2	3	4	5	6

19. How much would it have upset you if you had been asked to weigh yourself once a week (no more, or less, often) for the next four weeks? (WC)	0 1 2 3 4 5 6
20. How dissatisfied have you been with your <u>weight</u> ? (WC)	0 1 2 3 4 5 6
21. How dissatisfied have you been with your <u>shape</u> ? (SC)	0 1 2 3 4 5 6
22. How uncomfortable have you felt about <u>others</u> seeing your shape or figure (for example, in communal changing rooms, when swimming, or wearing tight clothes)? (SC)	0 1 2 3 4 5 6

(R) indicates items on the Restraint subscale

(WC) indicates items in the Weight Concern subscale*

(SC) indicates items in the Shape Concern subscale*

* Items on the Weight Concern and Shape Concern subscales were combined to assess body dissatisfaction

Appendix J

Dutch Restrained Eating Scale (van Strien, Frijters, vanStaveren, Defares, & Deurenberg, 1986)

Please mark your best response to the following questions:					
	never	seldom	sometimes	often	very often
1. When you have put on weight, do you eat less than you usually do? ___ check if not applicable					
2. Do you try to eat less at meal times than you would like to eat?					
3. How often do you refuse food or drink offered because you are concerned about your weight?					
4. Do you watch exactly what you eat?					
5. Do you deliberately eat foods that are slimming?					
6. When you have eaten too much, do you eat less than usual the following day? ___ check if not applicable					
7. Do you deliberately eat less in order not to become heavier?					
8. How often do you try not to eat between meals because you are watching your weight?					
9. How often in the evenings do you try not to eat because you are watching your weight?					
10. Do you take into account your weight with what you eat?					

Appendix K

Center for Epidemiologic Studies Depression Scale (Radloff, 1977)

The 20 items below refer to how you have felt and behaved during the last week. Choose the appropriate answer.				
	Rarely or none of the time (<1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of the time (3-4 days)	Most or all of the time (5-7 days)
1. I was bothered by things that don't usually bother me.				
2. I did not feel like eating; my appetite was poor.				
3. I felt that I could not shake off the blues even with the help of my family or friends.				
4. I felt that I was just as good as other people.				
5. I had trouble keeping my mind on what I was doing.				
6. I felt depressed.				
7. I felt everything I did was an effort.				
8. I felt hopeful about the future.				
9. I thought my life had been a failure.				
10. I felt fearful.				
11. My sleep was restless.				
12. I was happy.				
13. I talked less than usual.				
14. I felt lonely.				
15. People were unfriendly.				
16. I enjoyed life.				
17. I had crying spells.				
18. I felt sad.				
19. I felt that people disliked me.				
20. I could not get "going".				

Appendix L

Feedback Questions

Please answer the following questions about the things you learned in the Body Image Project:

Please circle:	All the Time	A lot	A Medium Amount	A Little	Not at All
1) How often have you incorporated what you learned in the <i>Body Image Project</i> into your life?	1	2	3	4	5
2) How often do think about the things you learned in <i>Body Image Project</i> ?	1	2	3	4	5
3) How often do you talk about the <i>Body Image Project</i> with someone else?	1	2	3	4	5

Please circle:	Very Much	A lot	A Medium Amount	A Little	Not at All
1) How much did the things you discussed in the <i>Body Image Project</i> <u>change</u> the way you feel about pursuing the thin-ideal?	1	2	3	4	5
2) How much did the <i>Body Image Project</i> make you want to pursue the thin-ideal <u>less</u> or stop pursuing it altogether?	1	2	3	4	5
3) How much did the <i>Body Image Project</i> make you want to pursue the thin-ideal <u>more</u> ?	1	2	3	4	5
4) How much did you feel influenced by the <u>group</u> to change how you felt about the thin-ideal (e.g., because everyone else was saying they would change)?	1	2	3	4	5
5) How much did you feel influenced by your <u>self</u> to change how you felt about the thin-ideal (e.g., because you learned new information that convinced you to change your mind)?	1	2	3	4	5

Please circle:	Very Much	A lot	A Medium Amount	A Little	Not at All
6) How much did you enjoy the <i>Body Image Project</i> ?	1	2	3	4	5
7) Did the <i>Body Image Project</i> teach you new information?	1	2	3	4	5
8) If you <u>felt better</u> about your body image after this program, what was the main reason? (please write):					
9) If you <u>did not feel better</u> about your body image after this program, what was the main reason? (please write):					

Appendix M

Table 10

Group size, adherence, and average within-group Cohen's d for peer leader teams during active and waitlist implementation

Team	Active Groups				Waitlist Groups			
	Group size	Adherence	M (SD) d Pre-Post	M (SD) d Pre-FU	Group size	Adherence	M (SD) d Pre-Post	M (SD) d Pre-FU
Team 1	6	94.00%	0.13 (0.47)	0.22 (0.63)	--	--	--	--
Team 2	6	86.00%	0.31 (0.45)	0.26 (0.82)	--	--	--	--
Team 3	--	--	--	--	12	86.50%	0.22 (0.25)	0.22 (0.21)
Team 4	11	94.87%	0.78 (0.19)	0.51 (0.18)	12	94.98%	0.24 (0.11)	0.37 (0.17)
Team 5	7	96.44%	0.73 (0.37)	0.24 (0.35)	6	81.66%	0.30 (0.28)	-0.14 (0.17)
Team 6	5	89.18%	0.44 (0.66)	0.01 (0.24)	8	77.96%	0.46 (0.29)	0.49 (0.34)

Note: Adherence is presented as the average adherence ratings for Session 1 and Session 2. Teams 1-3 were leaders in Study 1 and each delivered the intervention one time; Teams 4-6 were leaders in Study 2 and each delivered the intervention 2 times. Average Cohen's d is presented as the mean (standard deviation) of effect sizes across outcome measures. FU = follow-up.