A BRIEF NON-DIETING INTERVENTION INCREASES INTUITIVE EATING AND REDUCES DIETING INTENTION, BODY IMAGE DISSATISFACTION, AND ANTI-FAT ATTITUDES: A RANDOMIZED CONTROLLED TRIAL

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Abstract

Objective: Young adults report high levels of body image dissatisfaction and dieting, and are vulnerable to both weight gain and disordered eating. Non-dieting approaches have demonstrated psychological and physiological benefits in women who are overweight or obese. This study developed and examined a brief dissonance-based non-dieting intervention designed to help college women reject unhealthy dieting behaviors, accept their bodies, and increase healthy eating.

Method: Participants included 94 University of Hawaiʻi students, randomly assigned either to the non-dieting intervention condition or a brochure control condition. The intervention consisted of two 90-120 min interactive group sessions designed to engender the rejection of dieting, increase body acceptance, and develop healthy eating skills. Assessment measures were collected at baseline, post-treatment, and one month follow-up.

Results: The intervention produced significant improvements in the intervention group compared to the control group on measures of dieting intention, intuitive eating, body image dissatisfaction, eating concerns, anti-fat attitudes, and knowledge about the effects of dieting and healthy eating. These effects were sustained at follow-up. There were also overall improvements over time in dietary intake and mental health-related quality of life that were not specific to condition. There were no significant effects on BMI. Feedback questions gathered at follow-up showed that participants in the intervention condition reported significantly more incorporation of what they learned from the study into their lives, and greater perceived effects on motivation and self-efficacy regarding eating healthfully and rejecting the dieting mentality.

Discussion: This study extends the research on non-dieting approaches by using a brief, dissonance-based structure, and applying the intervention to a young adult sample that included participants of normal weight. The findings here indicate that a non-dieting approach can be well-received by this population and result in improvements in eating and weight-related behaviors. Study limitations such as differential attrition by condition and reliance on self-report measures are discussed. Longer follow-up is needed to assess whether the intervention effects are sustained over time and whether additional benefits might emerge such as lowered incidence of eating disorders and greater weight stability.

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List of Abbreviations

Abbreviation	Term
ANOVA	Analysis of variance
AAQ	Anti-Fat Attitudes Questionnaire
BMI	Body mass index
BSQ-8C	Body Shape Questionnaire – 8-item Version C
CBT	Cognitive behavioral therapy
EAT-26	Eating Attitudes Test-26
HAES	Health-at-Every-Size
ICC	Intra-class correlation coefficient
IES	Intuitive Eating Scale
NCI	National Cancer Institute
PS	PrimeScreen
RCT	Randomized-controlled trial
SF-12 MCS	Short Form-12 Mental Component Scale
USDA	United States Department of Agriculture
WLBS	Weight Loss Behavior Scale

Introduction

Rates of overweight and obesity have risen steadily worldwide (World Health Organization, 1999) but particularly so in the United States, where two-thirds of adults are now classified as overweight (body mass index [BMI; kg/m^2] ≥ 25 kg/m^2) or obese (BMI ≥ 30 kg/m^2; C. L. Ogden, Carroll, Kit, & Flegal, 2012). This increase is even more dramatic in young adults (Hedley et al., 2004) and has been termed by many as an "epidemic" (Calle, Rodriguez, Walker-Thurmond, & Thun, 2003; Mokdad et al., 2003) because of the link between obesity and impaired health (Bray, 2004; Calle et al., 2003; Patterson, Frank, Kristal, & White, 2004). Specifically, obesity is associated with a myriad of health consequences, including orthopedic difficulties, chronic disease such as atherosclerosis, diabetes mellitus, and certain cancers, as well as higher mortality rates (Chiolero & Paccaud, 2009; Oliver, 2006). The problem of obesity is commonly considered one of the greatest health crises currently facing the United States (Koplan, Liverman, & Kraak, 2005; Oliver, 2006) and other Western countries (Chiolero & Paccaud, 2009).

Weight-Loss Interventions

As the prevalence of overweight and obesity have risen, so have efforts to find effective means of weight loss (National Heart, Lung, & Blood Institute, 1998). Identifying solutions to obesity has been a major thrust of research and funding agencies, with hundreds of millions of dollars now granted to obesity research and programs (Lyn, Moore, & Eriksen, 2012). A fundamental consideration is however, that despite decades of psychological, nutritional, and pharmacological research, studies have yet to attain any real success at helping people maintain substantial weight losses over time (French, Jeffery, & Murray, 1999; Jeffery et al., 2000; Mann et al., 2007). Behavioral and pharmacological interventions typically result in only 5-10% weight loss, which is rarely enough to reverse obesity (Jeffery et al., 2000). Moreover, weight regain typically begins within one year after treatment, resulting in a reliable return to baseline weight approximately 3 years following treatment (Tsai & Wadden, 2006). At best, 3-5% of participants in research trials will achieve significant long-term weight-loss maintenance (Z. Cooper & Fairburn, 2002; French et al., 1996; Sarlio-Lähteenkorva, Rissanen, & Kaprio, 2000). Recently, a state-of-the-art treatment explicitly focused on weight-loss

maintenance reported similarly disappointing results (Z. Cooper et al., 2010). Beyond academic interventions, there is a weight-loss industry estimated at 61 billion dollars annually (MarketData Enterprises, 2011), and as many as 75% of women have reported a history of dieting (Jeffery, Adlis, & Forster, 1991), while overweight and obesity prevalence rates have steadily increased. The only weight loss intervention with demonstrable long-term effectiveness is bariatric surgery (Tsai & Wadden, 2006), which is invasive, usually irreversible, conveys significant risks of complications, and has life-time side-effects including risk of malnutrition (Bessler et al., 2012). Even with surgery, substantial weight regain is seen, with 9-25% of bariatric patients maintaining a weight loss averaging 5% of less (Christou et al., 2004; Sjöström et al., 2004; Stunkard, Harris, Pedersen, & McClearn, 1990) and 20-35% of procedures considered failed.

Reasons for Limited Effectiveness of Weight-Loss Treatment

Obesogenic environment. Poor weight loss and weight loss maintenance are popularly blamed on individual failed adherence to recommended physical activity and caloric goals. This is consistent with the commonly held view that individuals are to blame for becoming obese in the first place (Crandall, 1994; Lewis, Cash, Jacobi, & BubbLewis, 1997). When the majority of adults are overweight or obese, however, weight gain must be considered a normal response to the current "obesogenic" environment (Brownell & Horgen, 2004). The degree to which individuals can control their body weights is debated. The genetic component of body weight is high, with twin studies indicating genetic factors accounting for 50-70% of BMI variance (Allison et al., 1996; Stunkard et al., 1990). On the other hand, most obesity researchers have concluded that environmental change is the only sensible explanation for the strikingly rapid increase in rates of obesity over the past few decades (e.g., Thomas A. Wadden, Brownell, & Foster, 2002). The primary elements of this so-called "obesogenic" or "toxic" environment include a) machinery that has reduced the need for physical activity and b) the abundance and aggressive advertising of palatable and calorically dense food (J. Ogden, 2010; Thomas A. Wadden et al., 2002). These features predispose humans to weight gain, in stark contrast to the conditions throughout most of human history (and still in much of the world) in which weight gain was difficult to achieve and starvation and malnutrition were pervasive threats to survival. Evolution-based theory posits that

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the rapid and recent shift in Western society has left a misalignment between evolved adaptations and the current environment (Horgen & Brownell, 2002; Swinburn & Egger, 2004).

Evolutionary asymmetry. Speakman (2004) describes evolutionary pressures that would support defense against both weight gain and weight loss. For example, relatively low energy stores would threaten survival both through risk of starvation and susceptibility to disease, while relative high energy stores would impair survival by increased vulnerability to predation. In animals (e.g., rodents), very strong counter-regulation to both weight gain and weight loss is observed (Speakman, 2004). On the other hand, in most humans the regulation appears to protect more strongly against weight loss than weight gain (Rosenbaum, 2012). Speakman (2004) argues that humans progressively developed protections against the major vulnerabilities associated with increased adiposity. This created an asymmetry in selection forces, in which genes that promote body fat storage were not selected against (and many argue that these genes, termed "thrifty" genes, were adaptive), while genes promoting weight loss continued to be strongly selected against, resulting in regulatory systems that are particularly biased against body fat loss.

Set-point theory. Set-point theory suggests that the body has a biologically determined set-point weight (more specifically, energy store level), around which an active regulatory system operates (Bouchard, 1996; Keesey, 1986; Speakman, 2004). The mechanisms of this regulatory system are not yet fully understood. Energy homeostasis appears to be maintained through adjustments to both energy intake and output. Vasselli (2004) describes a model of appetite regulation in which there are short-term and long-term feedback loops. The short-term component determines the onset and termination of eating occasions, and is modulated by signals from the long-term component that monitors energy stores. Many hormones are implicated in these regulatory processes (for a complete discussion, see Speakman, 2004). Of particular interest here, adipose tissue appears to provide feedback to the long-term component by the secretion of leptin and other hormones. When there is a positive energy balance, adipose cells fill with lipids; however, once this process approaches maximization, adipose cells begin to proliferate to accommodate more energy storage. These new cells

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are permanent and may contribute to a resetting of the body's set-point to a higher level of adiposity (Speakman, 2004).

Defense against weight loss. Whether or not the body is defending a new, higher set-point, or the regulatory system simply works against any major weight loss, there is strong support that significant biological and metabolic changes follow weight loss. As body mass decreases, so does the resting metabolic rate, and there is some evidence that this reduction in resting metabolic rate may be greater than expected (Leibel, Rosenbaum, & Hirsch, 1995); for example, people who are maintaining a 10% or greater loss in body weight will experience a 20-25% decline in 24-hour energy expenditure and require 300-400 fewer kcal/day than people at the same body weight without weight loss (Rosenbaum, 2012). Wing and Hill (2011) outline a number of other biological characteristics that appear to predispose people who have lost weight to regain that weight. Animal models demonstrate profoundly biological processes involving both decreased resting energy expenditure and increased energy consumption, which result in extremely rapid weight regain in weight-reduced rats once food restriction is lifted (MacLean et al., 2004, 2006). Similarly, there appear to be sustained increases in the drive to consume energy even after extended periods of weight-loss maintenance. These changes may be permanent; reduction in 24-hour energy expenditure does not appear to abate with time (Speakman, 2004), and hormonal changes after weight loss have been observed one year later (Sumithran et al., 2011). The few individuals who have successfully maintained substantial weight loss over time typically report very high levels of eating control and exercise (Meleo-Erwin, 2011), indicative of chronic suppression of regulatory processes that are aimed to produce weight gain.

Obesity prevention. As the impact of the body's regulation against weight loss and the difficulty of weight loss and weight-loss maintenance have been clarified, many researchers and public health advocates have shifted focus from obesity treatment to obesity prevention programs (Rossen & Rossen, 2012). This approach is fairly recent and there is not yet so far lacks strong empirical support. Although BMI, dietary behaviors, and physical activity can be positively impacted in the short-term, systematic reviews indicate that prevention interventions with children show little to no effect on future BMI (Brown et al., 2009; Katz, O'Connell, Njike, Yeh, & Nawaz, 2008); however,

given that most studies have intervened on the broad population level, and follow-up periods have been short, this is not unexpected (Summerbell et al., 2005). There is a similar dearth of support for obesity prevention studies in adults (L. M. Anderson et al., 2009; Rossen & Rossen, 2012). In light of the unknown effectiveness of prevention strategies and the ineffectiveness of weight-loss treatments, exploration of alternative targets for improving health outcomes is needed.

Alternative Targets for Intervention

Weight loss and weight-gain prevention have been primary targets of most intervention programs because adiposity is viewed as the main culprit in the association between BMI and increased health problems. Adipose mass is thought to induce biochemical changes that negatively impact the body as well as contribute to orthopedic and arthritic problems through increased pressure and strain. A number of researchers argue, however, that causality has not been clearly established and the relationship among these factors is likely far more complex (Bacon & Aphramor, 2011; Burgard, 2009; Muennig, Jia, Lee, & Lubetkin, 2008). Alternative models have been proposed including other variables as mediators or third variables, such as physical activity and unhealthy dieting behaviors. These factors will be detailed below.

A few points are worth noting here. To whatever extent the predominant view holds, and adiposity itself is a significant causal agent of health impairment, adiposity cannot be addressed directly through behavioral interventions, which by definition address other factors, such as diet and physical activity. Moreover, if behavioral interventions do not reliably and sustainably impact adiposity, the importance of adiposity as a causal factor loses its relevance; modifiability is an essential consideration in assessing intervention targets. Modest weight losses of 5-7% are associated with important improvements in health risks such as reduced blood pressure and cholesterol (Blackburn, Phillips, & Morreale, 2001; Mertens & van Gaal, 2000; Wing & Jeffery, 1995), insulin resistance (Jeffery et al., 2000), and significantly reduced incidence of Diabetes Mellitus (Diabetes Prevention Program Research Group, 2002). These findings comprise an important justification for weight-loss treatment, even in the absence of large or sustained weight loss. However, these benefits occur despite the typical maintenance of obese or overweight status. This suggests that the health benefits may not be due

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entirely to substantial reductions of adipose tissue. An alternative interpretation is that the health gains may be attributable to other changes induced by treatment, such as increased physical activity and intake of fruits and vegetables.

      Health habits. Lifestyle habits, such as eating patterns (Vartanian, Schwartz, & Brownell, 2007), sleep (Kripke, Garfinkel, Wingard, Klauber, & Marler, 2002), and physical activity (Blair & Church, 2004), have been linked to health. They may also partially explain the relationship between adiposity and health impairment. For example, eating patterns that result in a surplus of caloric intake may contribute independently to obesity and health problems. Excess caloric intake might impair health in a number of ways. A continual surplus of caloric intake may result in excess nutrition being passed into cells, which is known to damage cells (Wellen & Thompson, 2010). In response, cells may become insulin resistant, which can contribute to an imbalance in circulating blood nutrients that can damage organs (Roberts & Sindhu, 2009). Eating patterns may also involve the over-intake of substances that are harmful to the body, such as trans fats (Hu, Manson, & Willett, 2001) or refined sugar (Ludwig, 2002). In a reciprocal manner, eating patterns may involve under-intake of important macro- and micro-nutrients. The standard American diet can result in all three factors: too many calories, too many unhealthy foods, and too few healthy foods (Grotto & Zied, 2010). Similarly, physical activity and sleep have been well established as important to health, and low amounts of both are thought to impact weight gain through less energy expenditure (Moore & Pi-Sunyer, 2012) and metabolic and endocrine effects (Hurley et al., 1986; Spiegel, Leproult, & Van Cauter, 1999; Taheri, Lin, Austin, Young, & Mignot, 2004). Even without weight change, increases in physical activity and healthy eating have been shown to reduce health risks (Bacon, Stern, Van Loan, & Keim, 2005; Björntorp, de Jounge, Sjöström, & Sullivan, 1970; Katzer et al., 2008; Lamarche et al., 1992).

      Psychosocial factors. Biopsychosocial health research has identified a number of ways in which psychosocial factors such as stress, depression, and social isolation directly and indirectly contribute to chronic disease (Cohen, Janicki-Deverts, & Miller, 2007; Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002). Notably, weight bias is a common and potent force, resulting in employment and social discrimination (Puhl & Heuer, 2010). The social repercussions of weight bias are implicated in vulnerability to

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the psychosocial factors listed above (e.g., stress; Puhl & Latner, 2007). Stigma and discrimination are starting to be examined as factors that may have an impact on health (Amy, Aalborg, Lyons, & Keranen, 2006). Barriers to appropriate medical care in the form of bias from medical professionals and reluctance to seek care among people at higher BMIs may also affect health outcomes (Cash, Phillips, Santos, & Hrabosky, 2004; Fontaine, 2003; Kolotkin, Crosby, & Williams, 2002; Schwartz, Chambliss, Brownell, Blair, & Billington, 2003).

Body image dissatisfaction. In addition, body image dissatisfaction, experienced to a greater degree by obese people than non-obese people (Sarwer, Thompson, & Cash, 2005), has been examined as a possible mediator of the relationship between BMI and health impairment (Muennig et al., 2008). The health consequences of overweight and obesity are experienced differently according to gender and ethnicity; groups with greater emphasis on a thin body ideal, such as white females, tend to experience worse health outcomes at lower BMIs (Cash et al., 2004; Fontaine, 2003; Kolotkin et al., 2002). Muennig and colleagues (2008) found that current-ideal weight discrepancy predicted mental and physical health more strongly than BMI predicted mental and physical health, In a subsequent study (Muennig & Bench, 2009), BMI was not associated with self-rated health in a Dominican Republic community that did not stigmatize obesity. Likewise, Wilson and colleagues (2013) found that body image dissatisfaction mediated the association between self-reported BMI and poorer physical function in college students. Body image dissatisfaction may also impact health behaviors; it is associated with dieting behavior (Markey & Markey, 2005; Putterman & Linden, 2004), and avoidance of physical activity (Markland, 2009). Body image dissatisfaction is also linked to increased stress and decreased mood and self-esteem (Friedman, Reichmann, Costanzo, & Musante, 2002; Johnson & Wardle, 2005)

Unhealthy dieting. Many have argued that dieting itself contributes to weight gain and poor health outcomes (Bacon & Aphramor, 2011; Burgard, 2009). Dieting, defined as the purposeful attempt to create an energy deficit to generate weight loss, is more common in individuals with increased BMI (Hill, 2002). Longitudinal studies suggest that in youth, dieting is a risk factor for weight gain (Field et al., 2003), onset of obesity (Stice, Presnell, Groesz, & Shaw, 2005), binge eating (Stice, Presnell, &

Spangler, 2002), and eating disorders (Killen et al., 1996; Patton, Selzer, Coffey, Carlin, & Wolfe, 1999).

Dieting encompasses an assortment of behaviors, several of which Neumark-Sztainer and colleagues (2006) have classified as healthful (e.g., exercising, eating fruits and vegetables, reducing high-fat foods and sweets, etc.) and several as unhealthful (e.g., fasting, eating very little, food substitutes, skipping meals, diet pills, self-induced vomiting, laxative use, diuretics, etc.). Some behaviors endorsed for weight control are less easily classified. For example, frequent self-weighing has been found to negatively impact mood in some studies (J. Ogden & Evans, 1996; J. Ogden & Whyman, 1997) but was associated with decreased disinhibition of eating and improved mood in another study (Wing et al., 2007) and is an intervention target to reduce over-evaluation of body weight in cognitive behavioral therapy (CBT) for eating disorders (Fairburn, 2008). Generally speaking, healthful dieting behaviors overlap with the health behaviors discussed above, such as eating more fruits and vegetables and increasing physical activity. They are only termed dieting behaviors when done for the express purpose of weight control. On the other hand, many dieting behaviors, such as binge eating, purging, fasting, and cutting out macronutrient groups are known to negatively impact health. People with higher BMIs are more likely to employ both healthful and unhealthy dieting behaviors (Gillen, Markey, & Markey, 2012), and a number of studies have found higher BMI to be associated with greater use of unhealthful dieting behaviors (Eisenberg, Neumark-Sztainer, Story, & Perry, 2005; Kushner, 2010; Markey, Markey, & Birch, 2001). Thus, it is plausible that unhealthy dieting behaviors could partially account for the association between BMI and poorer health outcomes.

A more general concern about dieting is that it encourages the disregard of hunger and satiety signals. Given evidence suggesting that the body's hunger and satiety signals are part of a regulatory system to maintain weight at or near a set-point, eating in accordance with these signals is likely important in facilitating energy homeostasis. This style of eating has been advocated by many researchers (Bacon, 2010; Tribole & Resch, 2003) and has been used to treat binge eating (Craighead & Allen, 1995; McIntosh, Jordan, Carter, Latner, & Wallace, 2007). In contrast to these internally determined cues,

dieting involves externally determined cues, often in the form of rules about intake such as daily calorie limits and foods to avoid.

Intuitive eating. Intuitive eating, also called attuned eating, is defined as eating according to physiological signals, rather than emotional or situational cues (Craighead & Allen, 1995; Tribole & Resch, 2003). In its simplest form, it means eating when hungry and stopping when satiated. Intuitive eating is considered by many to be an adaptive form of eating, associated with attendance to physiological needs in the absence of preoccupation with food (Carper, Orlet Fisher, & Birch, 2000; Craighead & Allen, 1995; Fedoroff, Polivy, & Herman, 1997; Polivy & Herman, 1992; Tribole & Resch, 2003). Tylka (2006) described three common and interrelated features central across conceptualizations of intuitive eating: unconditional permission to eat any desired food when hungry, eating prompted by physical hunger rather than emotions, and using hunger and satiety cues to determine how much to eat. It is posited that intuitive eating will result in the natural maintenance of weight within its ideal range, and intuitive eating has been associated with lower BMI (Avalos & Tylka, 2006; Kahan, Polivy, & Herman, 2003). Young children (ages 2-5) allowed to determine food intake themselves have been found to have balanced daily caloric intake even when the amount and type of food eating at each meal varies (Birch, Johnson, Andresen, Peters, & Schulte, 1991). Some researchers have suggested that dieting may disrupt the natural regulation of weight (Bacon, 2010; Tribole & Resch, 2003). Since hunger and satiety signals are the primary mechanisms through which the body modulates intake to regulate body weight, it is argued that non-intuitive eating can lead to increases in body weight set point.

Although commonly advocated in eating disorder programs and non-dieting programs (Napolitano & Foster, 2012), studies explicitly examining the construct of intuitive eating are limited. Two intuitive eating scales have been developed recently (Hawks, Merrill, & Madanat, 2004; Tylka, 2006). Tylka's (2006) scale is based on the three factors listed above, while Hawks delineates four factors, termed intrinsic eating, extrinsic eating, antidieting, and self-care. In studies using Tylka's (2006) scale, the reliance on hunger and satiety cues and eating for physiological reasons instead of emotional reasons were associated with less eating psychopathology (Avalos & Tylka, 2006; Tylka, 2006)

Notably, to the extent these factors explain the association between adiposity and impaired health, they may be important for everyone, regardless of weight status. Essentially, people across the BMI spectrum may be vulnerable to impaired health due to unhealthy lifestyle behaviors, body image dissatisfaction, and unhealthy dieting behaviors. As discussed above, the prevalence of sedentariness and unhealthy dietary behaviors has been attributed to a so-called "toxic" environment, and this environment acts on individuals across the weight spectrum. Those with a genetic vulnerability will tend to develop obesity in this environment, but even those who are not obese may be vulnerable to health problems and weight gain. Sedentariness and poor food choices are common across the BMI spectrum (Ham, Yore, Fulton, & Kohl, 2004; Rafferty, Reeves, McGee, & Pivarnik, 2002; The Task Force on Community Preventive Services, 2001). A number of researchers have suggested that our primary concern should be fitness rather than fatness (Blair & Church, 2004; Gaesser, 1999). The focus on weight may allow some people to underestimate the importance of health behaviors if they maintain a low or average weight. This is problematic because, as Burgard (2009) points out, every condition associated with elevated BMI is also found in people at lower BMIs.

Moreover, the factors considered to make up the "toxic" environment could be expanded to include unreasonably thin sociocultural body ideals (Owen & Laurel-Seller, 2000), rampant weight bias (Puhl & Latner, 2007), and normative dieting (Hill, 2002). These may contribute to body preoccupation and unhealthy food restriction, even in people who objectively do not have a weight problem. Body image dissatisfaction is so prevalent among women that it has been described as "normative discontent" (Grabe & Hyde, 2006; Polivy & Herman, 1987; Rodin, Silberstein, & Streigel-Moore, 1985). Similarly, dieting and restricted eating patterns are commonly reported across the BMI spectrum; about 4 out of 10 women are trying to lose weight at any one time, 55%-75% have dieted at least once (Jeffery et al., 1991; G. T. Wilson & Brownell, 2002) and 47% of women in the normal-weight category attempt to lose weight through dieting (Biener & Heaton, 1995).

Non-Dieting Approach

Non-dieting programs have been proposed as an alternative to dieting since the 1980s. Non-dieting programs have varied widely in length, techniques, and focus, but

they have generally emphasized education about the negative impact of dieting and the biological underpinnings of body size, eating according to internal rather than external cues, acceptance of self at any weight, and increased physical activity (Napolitano & Foster, 2012). Some early non-dieting programs were designed to engender weight loss (Sbrocco, Nedegaard, Stone, & Lewis, 1999) or prevent weight gain (Rapoport, Clark, & Wardle, 2000). More recently, non-dieting approaches have largely coalesced around the Health-at-Every-Size (HAES) approach, which specifically emphasizes weight neutrality, and in which weight is excluded as a target for intervention.

The emphasis of HAES is to improve health through body acceptance, balanced eating, and increased physical activity, while reducing or eliminating efforts to control weight (Bacon, 2010). Burgard (2009) argues that changes to eating and physical activity will be more sustainable when uncoupled from weight-loss goals. In a review published in 2011, Bacon and Aphramor identified six randomized-controlled trials (RCTs) examining non-dieting approaches to promote well-being in overweight and obese women (summarized in Table 1). All studies showed improvements in reported psychological outcomes (e.g., body image and mood) and behavioral outcomes (e.g., binge eating, physical activity) in the non-dieting conditions. Of the four studies that examined metabolic risk factors, three showed significant improvement in blood pressure or blood lipids (one study showed similar improvement in cholesterol and blood pressure in both the non-dieting intervention and cognitive behavioral treatment control). Bacon and Aphramor (2011) note that counter to concerns about the abandonment of dieting in people with overweight and obesity, none of the studies reported any adverse behavioral or physiological changes. They also reported improved retention rates in the non-dieting conditions. Bacon and Aphramor also found similar results in seven additional trials that did not meet the criteria of randomized controlled trials in peer reviewed journals.

Table 1.
Non-Dieting Studies.

Study	Sample	Treatment			Follow-up	
		Description	Length and completion	Outcomes	Length and completion	Outcomes
(Bacon, et al., 2002, 2005)	78 obese women, chronic dieters, age: 39.3 ± 4.5 BMI: 35.7 ± 3.6	**NDT: Non-dieting treatment** DT: Traditional behavioral weight loss program	6 mos NDT: 92% DT: 59%	NDT: +0.6kg; DT: -5.2kg[a]; NDT: small ↑ drive for thinness and body image avoidance; Restrained eating: ↓NDT and ↑DT; Both groups: ↓ blood pressure, disinhibition, bulimia symptoms, body dissatisfaction, and depression.	24mos NDT: 74% DT: 58%	NDT: +0.3kg; DT: -2.7kg; NDT: ↓ blood pressure, hunger, restrained eating, body dissatisfaction, depression, body image avoidance, & bulimia symptoms; Self-esteem: ↑ NDT & ↓ DT; Both groups: ↓ cholesterol & disinhibition
(Ciliska, 1998)	142 obese women, 37-41 years, BMI: 33-36	**NDT-P: Psycho-educational non-dieting treatment (interactive support & activities) NDT-E: Didactic non-dieting treatment (lectures only)** WLC: Wait-list Control	12 wks (NDT-P: 24h; NDT-E: 12h) NDT-P: 86% NDT-E: 77% WLC: 59%	No change in weight NDT-P: ↓ in blood pressure, body dissatisfaction, and restrained eating; ↑ self-esteem NDT-E: No change in self-esteem, body dissatisfaction or restrained eating	None reported	None reported
(Goodrick, et al., 1998)	190 overweight/ obese women, binge eaters, age: 40 ± 6.3, BMI: 33 ± 3.4	NDT: Nondieting treatment DT: Traditional behavioral weight-loss program (LEARN) WLC: Wait-list control	24 wks (24 hours) NDT: 83% DT: 85% WLC: 94%	NDT: +1.35kg[b]; DT: -0.57kg[b]; WLC: +0.64kg NDT & DT ↓ binge-eating	12mos (included biweekly maintenance sessions) NDT: 79% DT: 82% WLC: N/A	NDT: +1.19kg; DT: +1.48kg; NDT & DT ↓ binge-eating

Note. All outcomes listed are statistically significant, except change in weight (significance will be indicated separately.)
[a]Significant difference from baseline. [b]Significant between-group difference.

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Table 1. (Continued)
Non-Dieting Studies.

Study	Sample	Treatment			Follow-up	
		Description	Length and completion	Outcomes	Length and completion	Outcomes
(Provencher et al., 2007, 2009)	144 overweight and obese women, 42.3 ± 5.6 years, Mean BMI 30.1-30.6	**NDT: Non-dieting treatment;** SS: Social Support treatment - participants met to discuss same topics as NDT without direction; WLC: Wait-list control	4mos (NDT: 45hrs; SS: 28hrs) NDT: 92% SS: 81% WLC: 79%	NDT: -1.6kg^a; SS: -0.8kg; WLC: -0.4kg; NDT: ↓ hunger, cognitive restraint, and disinhibition	12mos, 74% overall	NDT: -0.6kg; SS: -0.3kg; WLC: 0.0kg; NDT: ↓ less situational susceptibility to disinhibition No change in metabolic parameters.
(Rapoport et al., 2000)	75 overweight and obese women, M_{age}: 47.5, M_{BMI}: 35.4	**NDT: Modified Cognitive-Behavioral Treatment (included focus on weight gain prevention)** DT: Standard CBT & 1200kcal/day	10 wks (20 hours) NDT: 84% DT: 84%	NDT: -1.3kg^b; DT: -4.6kg^{ab}; DT & NDT: ↓ in blood pressure, lipids, depression, perceived stress, binge eating, hunger, disinhibition, restrained eating, body dissatisfaction and body image avoidance, and ↑ self-esteem and dietary quality	12mos NDT: 84% DT: 84%	NDT: -2.0kg^a, DT: -3.8kg^a No sig. change from post-treatment in psych data
(Tanco, Linden, & Earle, 1998)	50 women with a 10y history of obesity & 3 prior weight-loss attempts, M_{age} not reported, M_{BMI} 38.7-40.7	**NDT: Cognitive Group Treatment (Non-dieting)** DT: Traditional behavioral weight-loss program (1200-1500kcal/day WLC: Wait-list control	8wks (16hrs; optional 4 additional wks) NDT 90%; DT: 90%; WLC: 68%	NDT: -1.8kg^a; DT: -2.6kg^a; WLC: +0.8kg; NDT: ↓ in depression, anxiety & eating-related psychopathology DT & WLC: No sig. change in above variables NDT & DT: ↑ in proportion of regular exercisers	6mos NDT: 60% DT: 43% WLC: N/A	NDT: -4.9kg^a, DT: -8.9kg^a No sig. differences in proportion of regular exercisers

Note. All outcomes listed are statistically significant, except change in weight (significance will be indicated separately.) [a]Significant difference from baseline. [b]Significant between-group difference.

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Although the original studies included weight and BMI as outcome measures, Bacon and Aphramor (2011) did not review changes to weight. The study authors generally predicted that the dieting conditions would facilitate initial weight loss, while small or no weight losses were expected in the non-dieting conditions; however, it was expected that those studies with sufficiently lengthy follow-up would find initiation of weight regain in the dieting conditions, and greater weight stability in the non-dieting conditions. The results from two studies followed this pattern (Bacon et al., 2002, 2005; Rapoport et al., 2000), and a third study did so to a lesser degree (Goodrick et al., 1998). Provencher (2007, 2009) and Ciliska (1998) did not include dieting conditions, and found small or no weight loss, respectively. One study found significant weight loss in both the dieting and non-dieting conditions (significantly greater weight loss in the dieting condition), with increased weight loss through the follow-up period; however, the treatment was only eight weeks in length with a follow-up period of six months, so it is likely that it did not capture the expected weight regain (Tanco et al., 1998).

Bacon et al. (2002, 2005) and Provencher et al. (2007, 2009) focused explicitly on fostering intuitive eating patterns, although neither utilized an intuitive eating scale. Bacon et al. used the Eating Inventory and Provencher et al. used the Three Factor Eating Questionnaire to measure related constructs, such as cognitive control over eating, susceptibility to hunger, and food-related disinhibition. Provencher et al. also had participants rate their appetite sensations in response to a standardized breakfast. When Bacon et al. (2002, 2005) compared HAES to a standard dieting intervention, HAES participants significantly improved health markers such as blood pressure and cholesterol levels at a one-year follow-up, whereas participants in the dieting group had not maintained any significant weight losses or health marker improvements. Additionally, participants were much more likely to drop out of the dieting intervention than the HAES intervention (Bacon et al., 2005).

Applications to Non-Overweight

Participants in the six RCTs reviewed were all overweight or obese, and HAES interventions have targeted improving physical and psychosocial well-being in people in these categories. Yet, the very name of the approach – Health-at-*Every*-Size – implies that health is important to address at all sizes. Burgard (2009) asserts that the HAES

model is for people of all BMIs. As noted above, health behaviors such as sound nutritional intake and physical activity are important to people across the BMI spectrum. The obesogenic environment encourages poor nutrition and low physical activity generally (Brogan et al., 2012). Moreover, body ideals, especially for women, represent thinness to a degree essentially unattainable by most women (Groesz, 2002). In this context, women of nearly every size are subject to societal pressures to lose weight, to which dieting is a common reaction. Importantly, restrained eating may be more problematic in women who are not overweight or obese (J. Ogden, 2010). Extending the non-dieting approach to people at all sizes could convey important health and well-being benefits.

Young Adults

Young adulthood (ages 18 to 24) is a particularly promising time for intervention. Young adults are becoming independent, often living away from home for the first time, and establishing their adult lifestyle habits. Among 18 to 24 year olds, 43% report little or no physical activity and 78% report eating less than five fruit and vegetable servings daily (McCracken, Jiles, & Blanck, 2007). Weight gain is common during this period (Clement, Schmidt, Bernaix, Covington, & Carr, 2004; Delinsky & Wilson, 2008; Gordon-Larsen, Adair, Nelson, & Popkin, 2004; Jung, Bray, & Martin Ginis, 2008; Racette, Deusinger, Strube, Highstein, & Deusinger, 2008; Sheehan, DuBrava, DeChello, & Fang, 2003), due to body maturation and changes in lifestyle behaviors, as young adults leave the structure of their childhood homes (Ackard, Croll, & Kearney-Cooke, 2002; Pliner & Saunders, 2008). This is a time when body image concerns are elevated and disordered eating behaviors are more likely to develop. In one survey of college females, 71% of Caucasians and 77% of Asians reported a history of dieting (Ackard et al., 2002); not surprisingly, increased frequency of dieting was associated with increased eating disorder symptoms and body image dissatisfaction. Controlling for BMI, dieting frequency was associated with increased perceived body size and decreased ideal body size. The adoption of intuitive eating and rejection of unhealthy dieting behaviors may help young adults maintain homeostasis and reduce behaviors associated with weight gain, such as overeating. As it appears that body weight defense may be biased towards prevention of weight loss, reducing behaviors such as overeating might prevent excess

weight gain. Thus, an intervention to reduce unhealthy dieting, increase body acceptance, and increase healthy behaviors may be particularly salient for young adults.

Translation of HAES

In translating HAES interventions to a younger and lighter group, an important consideration is treatment intensity. In personal correspondence with the primary investigator (2012), Dr. Bacon indicated that body acceptance and rejection of dieting were very challenging for overweight or obese participants. Considering societal weight-bias (Puhl & Heuer, 2009) and overweight and obese people's discrepancy from the cultural ideals of thinness, it may be that body acceptance and rejecting unhealthy dieting would be easier for people who are not overweight or obese.

The original HAES intervention consisted of 24 weekly sessions (Bacon et al., 2005), which is unlikely to be feasible with non-overweight adults who generally show less interest in health interventions (Poobalan, Aucott, Precious, Crombie, & Smith, 2010). There is also some reason to believe that attitudes towards weight can be meaningfully changed through brief interventions that are carefully crafted to elicit attitude change. Two particularly well researched programs use cognitive dissonance techniques to engender rejection of the thin-ideal (Becker, Bull, Schaumberg, Cauble, & Franco, 2008; Stice, Rohde, Shaw, & Marti, 2012). These interventions are presented in two sessions lasting two hours each or in four sessions lasting one hour each, in which participants are repeatedly asked to critique the thin ideal and endorse its rejection through various activities. A brief intervention that utilizes cognitive dissonance strategies to facilitate the non-dieting goals of facilitating body acceptance and rejection of dieting may be an effective means of promoting attitude change.

Stice and Shaw (2004) provide guidelines for the development of programs to prevent disordered eating and increase healthy eating. These include program titles without stigma-laden language and overt focus on behavior change and emphasis on interactive content rather than psychoeducational content. Similarly, Fennell and Teasdale (1987) found that homework assignments may foster self-efficacy, by providing the opportunity to extend the scope of interventions and consolidate new skills.

This research is a first step to understanding whether the HAES approach can be valuable to a wider range of the population in addition to people who are overweight and

obese. This research aimed to establish that attitudinal change towards dieting is possible through a brief intervention using cognitive dissonance techniques, and if that were the case, whether it would be associated with psychological well-being and health behaviors, which may be protective against eating psychopathology and weight-related health problems.

The Current Study

This study examined the effectiveness of a dissonance-based non-dieting intervention in reducing unhealthy dieting behaviors, increasing intuitive eating, reducing body image dissatisfaction, reducing eating concerns, and improving dietary intake. As there is a focus on weight acceptance in the intervention, this study also looked at changes in anti-fat attitudes. As reduced dieting, improved body image, and reduced eating concerns are associated with better psychosocial functioning, effects on mental health-related quality of life were also examined. Finally, effects on knowledge of the effects of dieting and healthy eating guidelines were measured. This non-dieting intervention comprised two 90-120 min group sessions involving college women at the University of Hawai'i. Participants were randomized either to the two-session intervention or a brochure control condition, and these two groups are compared here. Data were collected at three time points: baseline, post-treatment, and 1-month follow-up. The following hypotheses were tested:

A. At post-treatment and at follow-up, the intervention group will report decreased dieting behavior and increased intuitive eating compared to the control group.

B. At post-treatment and at follow-up, the intervention group will report less body image dissatisfaction and decreased eating concerns compared to the control group.

C. At post-treatment and at follow-up, the intervention group will report improved dietary intake compared to the control group.

D. At post-treatment and at follow-up, the intervention group will report lower anti-fat attitudes than the control group.

E. At post-treatment and at follow-up, the intervention group will report improved mental health-related quality of life compared to the control group.

F. At post-treatment and at follow-up, the intervention group will have a greater increase in knowledge about dieting and healthy eating than the control group.

Methods

Participants

Participants were female students aged 18-30 at the University of Hawaiʻi. Exclusion criteria included being pregnant, intending to become pregnant, or having given birth within the past six months; having a BMI below 18.5 kg/m^2; and reporting significant eating psychopathology. Participation was limited to women for a number of reasons. Body ideals for men and women differ, with the result that although many men wish to lose weight, it is also very common for men to desire to increase their body size in terms of muscle mass (Oehlhof, Musher-Eizenman, Neufeld, & Hauser, 2009; Vartanian, Giant, & Passino, 2001). Compared to men, women are less satisfied with their bodies, more likely to diet, and more likely to diet at lower BMIs (Andreyeva, Long, Henderson, & Grode, 2010; French, Perry, Leon, & Fulkerson, 1995; Sondhaus, Kurtz, & Strube, 2001). Although not negligible, the risk of men engaging in unhealthy dieting and developing disordered eating is much lower than that seen in women (Andersen, 2002). Additionally, weight and body image can be sensitive topics, and it was expected that open dialogue during the workshops would be facilitated by women-only groups.

As very low body weight is known to interfere with hunger and satiety signals (Fairburn, 2008), underweight (BMI below 18.5 kg/m^2) participants were not included in this study. Additionally, participants with significantly elevated eating disorder symptomatology were screened via the Eating Attitudes Test-26 (EAT-26); those with a score of 30 or above were not included in the study.

Table 2.

Baseline Characteristics

Variable	Intervention	Control	Combined
Age	20.81 (0.48)	20.50 (0.37)	20.64 (2.90)
BMI	24.46 (0.70)	23.32 (0.44)	23.82 (3.88)
Ethnicity			
Caucasian	11 (24%)	12 (21%)	23 (23%)
Asian-American	12 (27%)	14 (25%)	26 (26%)
Hawaiian/Pacific Islander	1 (2%)	0 (0%)	1 (1%)
African-American	1 (2%)	1 (2%)	2 (2%)
Hispanic	4 (9%)	1 (2%)	5 (5%)
Multiple Ethnicities	16 (36%)	28 (50%)	44 (44%)
Sexual Orientation			
Heterosexual	42 (93%)	54 (96%)	96 (95%)
Homosexual	0 (0%)	0 (0%)	0 (0%)
Bisexual	3 (7%)	2 (4%)	5 (5%)

Note. For continuous variables, *M* and *SD* are reported, while for categorical variables *N* and % are reported.

Procedure

    Recruitment. Recruitment was conducted at the University of Hawai'i. Prospective participants were given a link to an online eligibility survey (see Appendix A). They were presented with the informed consent form and selected "yes" to proceed. Logic was included in the survey so that people who indicated being members of excluded groups (under 18, male, pregnant, EAT-26 score $\geq$ 30, or BMI below 18.5 kg/m^2) were notified and did not need to complete the entire eligibility survey. This survey collected information about participants' availability to participate in assessments and groups. Time slots were specified based on group leaders' schedules. To be included in the allocation pool, participants needed to nominate at least two time slots for which they would be available. All participants who were not eligible for participation were provided information for an alternative research opportunity as well as campus resources for students with eating/weight-related concerns.

    The goal for recruitment was a minimum of 40 participants in each condition. Due to a large amount of attrition between allocation and baseline assessment, a total of 132 participants were allocated, 66 to the intervention condition and 66 to the control condition. Of those participants, 43 in the intervention condition completed baseline and

56 in the control condition completed baseline. Six sets of workshops were conducted with an average of 7 participants in each workshop.

Assessment timeline. Participants were assessed at three time points: baseline, post-treatment, and 1 month follow-up. The assessment battery included anthropomorphic measurements (weight and height) taken in a private area (shielded from view) by a trained research assistant. The battery also included questionnaires assessing dieting, intuitive eating, body image, eating concerns, dietary intake, anti-fat attitudes, mental health-related quality of life, and knowledge of dieting effects and healthy eating. At follow-up, feedback questions were added to the battery.

Baseline assessment was conducted after randomization. Baseline assessment occurred within matched weeks for both conditions, to control for effects related to time of semester or year. After completing the baseline assessment, participants in the intervention condition participated in the first workshop and participants in the brochure control were provided with the body image brochure and time to review the brochure. One week later, participants either completed the second workshop or were given the second brochure and time to review it. Immediately afterwards, post-treatment assessment was conducted. Finally, participants in both conditions were asked to complete the follow-up assessment one month after session 2.

Whenever possible, follow-up data were collected in person. In order to collect as much follow-up data as possible, follow-up assessment was also completed via online survey in 21 cases (9 in the intervention group and 12 in the control group). Participants received extra credit from participating professors for completing the baseline and post-treatment assessments and a $10 gift card for their choice of Amazon, Starbucks, or Longs for participation in the follow-up assessment.

Condition 1 – Intervention Group. Groups of on average 7 women met for two 90-120 minute sessions led by psychology graduate students trained in CBT, cognitive dissonance techniques, and basic nutritional guidelines. Seven participants were unable to attend the second workshop for which they were scheduled, and five participants attended one of two makeup workshops that were run by one graduate student and one post-baccalaureate research assistant. These makeup workshops were held within five days of the participants' originally scheduled second workshop.

The goal of the intervention was to facilitate body acceptance and healthy eating patterns, in the spirit of the HAES approach. An important component was the rejection of unhealthy dieting and body ideals that are unattainable (without subverting the body's weight regulatory system). Additionally, activities were structured to utilize cognitive dissonance to create attitude change, by providing maximal opportunities for participants to critique unhealthy dieting and unreasonable body ideals; for example, identifying the costs of unhealthy dieting to the group leader roleplaying an unhealthy dieter. The structure of the intervention and the dissonance-based strategies were modelled off of the Body Project manual (Stice & Presnell, 2007).

Healthy eating skills were introduced as an alternative to unhealthy dieting. The primary goal of this component was to engender an intuitive eating style and provide simple and clear nutritional guidelines. Participants learned to create balanced and nutritious meals using the USDA MyPlate guidelines (which can be accessed at ChooseMyPlate.gov), to modify these recommendations to their needs, and to use hunger and satiety signals to guide eating. The emphasis on letting the body maintain homeostasis through adequate nutrition and attending to hunger signals was contrasted with dieting strategies that are malnourishing and based on subverting the body's regulatory processes.

Again, activities were structured to encourage participants to vocalize support for healthy eating and to critique unhealthy dieting. Additionally, activities included active implementation and problem-solving of healthy eating practices. Examples included adjusting typical meals to be closer to the USDA MyPlate guidelines and creating a personalized food plate to which participants added lists of favorite foods in each food group and positive self-statements.

In designing this study, nine female undergraduate research assistants were surveyed and consulted. Body acceptance was identified as the factor that would be most impactful on their lives. They were amenable to the idea that natural and healthy body weights vary, and they were particularly interested in the concept of set-point weight. They were able to discuss the pros and cons of dieting, and they described this content as convincing. They were interested in learning more about intuitive eating and nutrition. However, there was greater resistance to the idea that people can be healthy at every size,

with skepticism among some of the students that people with obesity could be healthy and that a non-dieting approach might be appropriate for people in the morbidly obese category. In light of time and content constraints, although this intervention was consistent with all aspects of the HAES approach, this content as well as physical activity were not emphasized as much as rejecting unhealthy dieting, intuitive eating and body acceptance.

Session 1 covered the following topics:

- Introduction
- Voluntary Commitment and Overview
  - Participants commit to full participation in the workshops.
- What is the dieting mentality?
  - Interactively discuss features of the dieting mentality.
- Costs of dieting mentality
  - Group discussion of the costs of the dieting mentality to the individual, their health, and society, and personal costs group members have experienced.
- Define balanced/healthy eating
  - Generate principles of balanced/healthy eating based on alternatives to the features of dieting mentality (e.g., flexibility instead of rules).
- Principles of intuitive eating
  - Introduction of main principles of intuitive eating: eating according to hunger and satiety signals.
- Health Pyramid
  - Discuss rubric for assessing messages about healthy eating and dieting – that healthy eating will first and foremost include enough food, the three macronutrient groups, and variety.
- Role play - Dieter
  - Split into 2 groups, with one group leader in each group roleplaying a dieter. Group members are asked to response to the group leader's statements with reasons not to diet.
- Home exercise – Monitor hunger and fullness signals (self-monitoring)

Session 2 covered the following topics:

- Welcome back

- Groups to review self-monitoring and problem-solve

  o Work in groups of 2-3 to talk about self-monitoring and discuss how to incorporate intuitive eating into their regular lives.

- Role play - Responding to unhealthy dieting messages

  o Group leader conveys common messages promoting unhealthy dieting behaviors, which group members practice challenging in a round-robin format.

- Basic food plate

  o Participants learn about the USDA MyPlate and how to individualize these guidelines.

- Create "my plate"

  o Using markers and a paper plate, create a personalized food plate with lists of favorite foods in each food group and positive self-statements.

- Positivity chain

  o Participants are given slips of paper with messages that counter the dieting mentality and are asked to choose and read aloud messages that they endorse. The slips of the entire group are connect to form a chain.

- Goal setting

  o Discuss goals as group regarding rejecting unhealthy behaviors and promoting balanced eating.

- Wrap-up

Condition 2 – Brochure Control. Control group participants received two educational brochures on body image and the USDA MyPlate guidelines. This was meant to reflect the typical amount of dietary guidance received by college students. Educational brochures have been shown to significantly reduce eating disorder symptoms and risk factors, making this a more rigorous control than assessment-only (Mutterperl & Sanderson, 2002). A diet control such as used in the Bacon (2002, 2005) HAES study was not used, as weight loss would not be appropriate for non-overweight participants. These brochures were not given to participants in the intervention condition.

Group leaders. Clinical psychology graduate students ran the intervention groups. These group leaders had experience running psychological intervention groups and working with eating disorder patients. Each intervention group was co-led by two clinical psychology graduate students. There were a total of three group leaders for the study: the study author was one of the co-leaders for all six of the sets of workshops, and the other two leaders each co-led three sets of workshops. The group leaders were provided manuals, and training, which lasted 4 hours, included review of cognitive dissonance-based strategies and practice of all materials. Undergraduate research assistants who had also received 4 hours of training in the protocol assisted as scribes during the workshops; they wrote down main discussion points on a white board and tracked adherence to the manual.

Measures

Anthropomorphic measurements. Weight and height were measured using a scale and stadiometer. Measurements were taken twice and averaged.

Demographics. Information about age, gender, ethnicity, and education level was collected from all participants.

Dieting. The Weight Loss Behavior Scale (WLBS: French et al., 1995) is an inventory of weight-control strategies. Participants are asked to rate their use of these strategies for the purpose of weight loss. The response option in the original measure was binary ("yes" and "no"), but in this study, a 9-point Likert-style scale was used to increase variability, with 1 = "Not at all likely" and 9 = "Extremely likely." This scale was also revised to specify the intention to use these strategies in the next year. For this study, two subscales were used. The Healthy subscale contains 11 items that are purported to be healthy dieting behaviors (e.g., eating smaller portions and exercising more) while the Unhealthy subscale contains 8 items measuring unhealthy dieting behaviors (e.g., using laxatives and fasting). This measure has not been used in many studies, but it has good face validity and there is some support for convergent validity with body weight and measures of dieting and body weight (French et al., 1995). In this sample, the Unhealthy subscale showed adequate internal consistency (Cronbach's alphas ranging from .76 to .79) and the Healthy subscale demonstrated a high level of internal consistency (Cronbach's alphas ranging from .88 to .90).

Intuitive eating. The Intuitive Eating Scale (IES; Hawks et al., 2004) was developed to measure orientation towards eating based on physiological cues rather than emotional or external cues. The IES contains 27 items on a 5-point Likert scale (ranging from 1 = "strongly disagree" to 5 = "strongly agree"). Nineteen items are reverse scored so that higher scores indicate greater endorsement of intuitive eating. The IES yields four subscales that were determined through factor analyses: Intrinsic, Extrinsic, Antidieting, and Self-Care. The Intrinsic subscale contains 4 items thought to measure eating that is guided by internal hunger cues (sample item: "I normally eat slowly and pay attention to how physically satisfying my food is."). The Extrinsic subscale contains 6 items designed to measure limited levels of eating that is cued by environmental or emotional factors (sample item [reverse scored]: "On social occasions, I feel pressure to eat the way those around me are eating—even if I am not hungry."). The Antidieting subscale contains 13 items measuring lack of dieting attitudes (sample item [reverse scored]: "There are certain foods that I really like, but I try to avoid them so that I won't gain weight." The Self-care subscale contains 4 items thought to measure prioritization of self-care over weight (sample item: "The health and strength of my body is more important to me than how much I weigh."). The psychometric properties of the IES were evaluated in a sample of college women (Hawks et al., 2004). Negative associations with dietary restriction (Hawks et al., 2004) and positive associations with amount of pleasure in eating (Smith & Hawks, 2006) provide some evidence of construct validity. The IES total score and subscales show adequate to good 4-week test-retest reliability (rs = .56 - .85). In this study, the subscales varied in internal consistency according to Cronbach's alphas, from poor (Instrinsic: .26 - .41), to adequate (Extrinsic: .77 - .79 and Self-care: .64 - .76), to good (Antidieting: .87 - .90). Due to poor internal consistency, the Intrinsic subscale was dropped from the analyses.

Body image. Body Shape Questionnaire - 8-item Version C (BSQ; P. J. Cooper, Taylor, Cooper, & Fairburn, 1987; BSQ-8C; Evans & Dolan, 1992). The BSQ is a 34-item self-report measure designed to assess participants' cognitive and affective weight and shape dissatisfaction, desire to lose weight, and fear of gaining weight. Evans and Dolan (1992) tested four 8-item shortened forms of the BSQ, and found that they were highly correlated with the full 32-item scale (.96 to .99) in a sample of White women.

The 8-item version C (Evans & Dolan, 1992) was used in this study. It includes items such as "Has seeing your reflection (e .g., in a mirror or shop window) made you feel bad about your shape?" and "Have you been afraid that you might become fat (or fatter)?" on a 6-point Likert-style scale ranging from "never" to "always." For this study, the average of all responses was used to create the overall score, with higher scores indicating greater weight and shape concerns. The BSQ has shown acceptable concurrent and criterion validity, including in samples of obese men and women (Cash & Fleming, 2002; Rosen, Jones, Ramirez, & Waxman, 1996). In this study, this scale showed a high level of internal consistency (Cronbach's alpha: .91 - .94).

  Eating concerns. The Eating Attitudes Test-26 (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982) is a 26-item measure of eating disorder symptomatology. Items are rated on a 6-point scale from "never" to "always." For screening purposes, the EAT-26 is often scored using a 0-3 system ("never," "rarely," and "sometimes," scored as 0, "often" as 1, "usually" as 2, and "always " as 3), and this scoring system was used during eligibility screening. However, the original 1-6 scoring was used for study outcomes (i.e., at baseline, post-treatment, and follow-up) in order to describe as much individual variation as possible. Responses on the 26 items were averaged to produce the overall scale. Good internal consistency has been found when administered to college women: alpha = .90 - .91 (Mazzeo, 1999; Miller, Schmidt, Vaillancourt, McDougall, & Laliberte, 2006), and this measure also demonstrates good 4 to 5 week test-reliability (r = .89; Banasiak, 2001). Scores are highly correlated with eating disorder status and symptom severity (Mintz & O'Halloran, 2000). It has shown discriminative validity between current and formerly eating disordered individuals (Hans-ChristophSeidel Steinhausen, 1993), and women with or without bulimia (Gross, Rosen, Leitenberg, & Willmuth, 1986). It is very commonly used as a screening measure (D. A. Anderson, De Young, & Walker, 2009), and reported predictive validity indicates that the use of a cut-off score of 20 is likely to produce false-positives (sensitivity = .77, specificity = .94; Mintz & O'Halloran, 2000). Discriminant validity suggests that the EAT-26 is satisfactorily limited to measuring disturbed eating behavior (Garfinkel & Newman, 2001). In this study, this measure had a high level of internal consistency (Cronbach's alpha = .86 - .87).

Dietary intake. PrimeScreen (PS; Rifas-Shiman et al., 2001). The PS is an 18-item self-report questionnaire that measures the frequency of consumption of various foods and food groups, such as fruits and vegetables, dairy products, whole grains, and red meat. Targets for assessment were chosen based on established associations with cardiovascular disease, cancer, and osteoporosis. The PS does not measure overall dietary intake. Participants are asked how frequently they consume particular foods or food groups on a scale ranging from "Less than once a week" to "Twice or more per day." This study used a modified version that queries based on the last week rather than the last year. The PS shows adequate 2-week test-retest reliability across food groups ($r = .70$) and is comparable to a well-established food frequency questionnaire, the SFFQ ($r = .61$). Criterion-related validity was also supported by moderate correlations with plasma levels of vitamin E, beta-carotene and lutein/Zeaxanthin (rs = .33-.43), which was similar to the SFFQ. In this study, the level of internal consistency was not high, Cronbach's alpha ranged from .61 to .72.

Anti-fat attitudes. The Anti-Fat Attitudes Questionnaire (AAQ: Crandall, 1994) is a 13-item measure of weight bias and fear of fat. Items are on a 10-point Likert-style scale that ranges from 1="Very strongly disagree" to 10="Very strongly agree." It produces three subscales, including Dislike (7 items), which examines negative perceptions of fat people (e.g., "I really don't like fat people much"), Willpower (3 items), which measures attributions of responsibility for fatness (e.g., "Some people are fat because they have no willpower"), and Fear of Fat (3 items), which measures one's own concern about weight (e.g., "I worry about becoming fat.") The AAQ has been examined in American and Canadian samples, and there is evidence for construct validity and internal consistency (Morrison, Roddy, & Ryan, 2009). In this study, the average scores across items within each subscale are reported, with higher scores indicating greater anti-fat attitudes. In this sample, the AAQ subscales showed adequate to good internal consistency, with Cronbach's alphas for Dislike, Fear of Fat, and Willpower ranging from .90 to .91, .84 to .92, and .73 to .86, respectively.

Mental health-related quality of life. The Short Form-12 (SF-12; Ware, Kosinski, & Keller, 1996) is a 12-item measure of health-related quality of life, based on the SF-36. The SF-12 produces two scores: a physical summary score (PCS) and mental

summary score (MCS). The scoring involves weighting using regression coefficients based on general U.S. population norms, and scores are transformed based on a mean of 50 and a standard deviation of 10, with higher scores indicating better functioning. For this study, the SF-12 MCS was used to assess mental health-related quality of life. The time frame of the measure was revised so that participants were asked to consider their experience over the past week rather than the past month. Response options to items vary, including both Likert-style items and yes/no response sets. Sample items include: "During the past week, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)? Accomplished less than you would like?" and, "How much during the past week... have you felt downhearted and blue?" The SF-12 has been found to replicate results from the SF-36 in the general US population with good support for criterion and convergent validity (Ware et al., 1996). There is also support that the SF-12 MCS is a valid measure of mental health and can be used to screen for both depression and anxiety (Gill, Butterworth, Rodgers, & Mackinnon, 2007). The MCS scale has also demonstrated adequate test-retest reliability ($r = .76$; Ware et al., 1996). In this sample, this measure demonstrated good internal consistency, with Cronbach's alphas ranging from .81 to .83.

Knowledge. Knowledge of the effects of dieting and healthy eating guidelines was assessed through questions written for this study based on content intended to be covered in the intervention and via the control group brochures. One item was open-ended and scored by two raters according to a rubric, with differences in scores averaged, 1 item was multiple choice, and 2 items were true or false.

Program Feedback. Feedback about the program was solicited through 22 questions asked at follow-up. Thirteen questions were on a 7-point Likert-style scale ranging from "strongly disagree" to "strongly agree." The mean of these responses was used to create a summary score, and 3 subscales were intuitively derived: Incorporation (5 items measuring incorporation and liking of study content), Healthy Eating (4 items measuring motivation and self-efficacy regarding eating healthfully), and Rejection of Dieting Mentality (4 items measuring and motivation and self-efficacy regarding rejecting the dieting mentality). All scales showed adequate to good internal consistency,

with Cronbach's alphas of .92, .92, .76, and .91, respectively. The remaining 9 feedback items were open-ended (see Appendix B).

Data Analytic Plan

Power Calculation. G*Power 3 (Faul, Erdfelder, Lang, & Buchner, 2007), was used to conduct a power calculation based on a 2 X 3 mixed Analysis of Variance (ANOVA). A meta-analysis of eating disorder prevention programs (Stice, Shaw, & Marti, 2007) reported small to moderate effect sizes on reduction of dieting in controlled studies, and based on this an effect size of .20 was selected. A total sample size of 66 was determined to be necessary to achieve power of .95. Brief cognitive dissonance interventions have shown attrition rates ranging from 3% to 11% (Becker et al., 2010; Stice & Shaw, 2004), and the briefest non-dieting study reported drop-out of 17% over eight weeks (Tanco et al., 1998). The goal for recruitment was at least 80 participants to allow for 17% attrition.

Participant Flow. Figure 1 details the study participant flow. Of the 66 participants who were allocated to the intervention group, 43 (65%) completed the baseline assessment and attended at least one workshop. Of the 66 participants who were allocated to the control group, 56 (85%) completed the baseline assessment and received at least one brochure. Of the 43 participants in the intervention group who completed baseline assessment and attended at least one workshop, 42 (98%) completed post-treatment assessment and 41 (95%) completed the follow-up assessment. Of the 56 participants in the control group who completed baseline assessment and received at least one brochure, 54 (96%) completed post-treatment assessment and 53 (95%) completed the follow-up assessment.
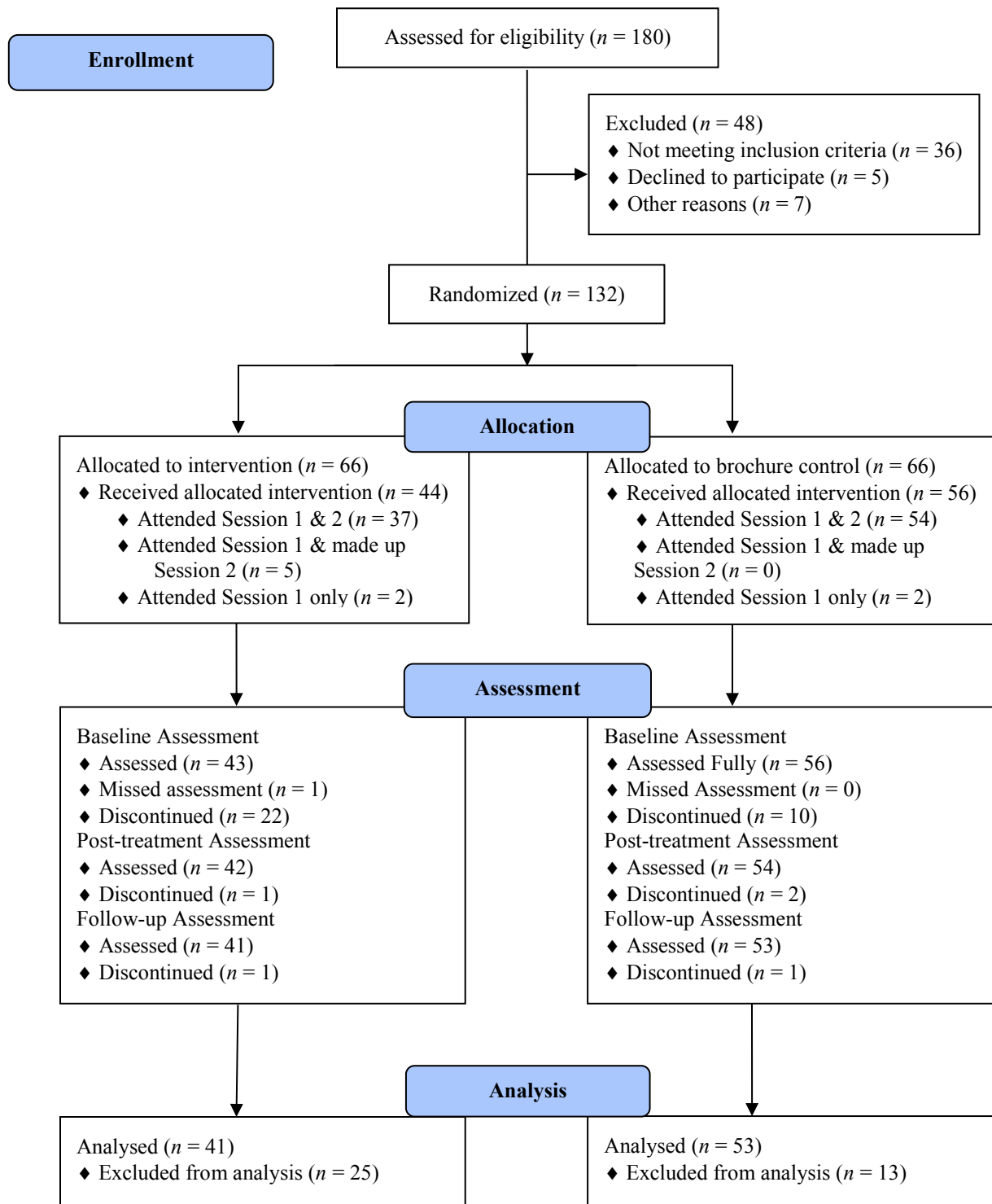
Figure 1. Participant Flow.

Missing data. For this study, only those participants who completed assessment at all time points were retained. Due to lateness, baseline data for one participant in the intervention group was not collected, and this participant was excluded from the analyses. Two other participants were late and were unable to complete two baseline measures (AAQ and SF-12), but they were retained in the sample. In addition, the main analyses were also conducted on a data set in which baseline was carried forward for missing time points. There were no significant differences in the results, thus only completer analyses are reported here. Analyses were conducted on a pairwise basis to account for those participants who completed each time point but were missing specific variables.

Independent sample t-tests were run for dependent variables and demographic variables (age and BMI) at baseline. No significant differences were found between the intervention and control groups. Baseline means and standard deviations were calculated for demographic variables and study measures. Changes across time and group in dieting intention, intuitive eating, body image dissatisfaction, eating concerns, dietary intake, anti-fat attitudes, mental health-related quality of life, and knowledge of dieting effects and healthy eating were examined using 2 X 3 mixed ANOVA. BMI was also examined using 2 X 3 mixed ANOVA, but no significant effects were predicted. Each ANOVA was structured with condition (intervention, control) as the between-subjects factor and time (baseline, post-treatment, and follow-up) as the within-subjects factor. In cases where time x condition interaction effects were found, separate repeated-measure ANOVA were conducted for each condition, with planned contrasts between baseline and post-treatment and post-treatment and follow-up, and one-way ANOVA were conducted to examine group effects at each time point.

Results

Pre-Baseline Attrition

Differences between participants who completed baseline and those who failed to do so were examined through a 2 X 2 ANOVA, as reported in Table 3. There were no significant differences identified on EAT scores, age, BMI, or time to graduation.

Table 3.

Differences on Screening Variables between Baseline Completers and Non-Completers by Condition

Source	df	F	p
EAT-26			
Condition	1, 128	1.12	.293
Baseline Completion	1, 128	0.33	.566
Condition * Baseline Completion	1, 128	0.00	.995
Age			
Condition	1, 128	0.15	.703
Baseline Completion	1, 128	0.06	.809
Condition * Baseline Completion	1, 128	2.15	.145
BMI			
Condition	1, 128	2.09	.151
Baseline Completion	1, 128	1.00	.319
Condition * Baseline Completion	1, 128	0.68	.412
Time to Graduation			
Condition	1, 128	0.32	.573
Baseline Completion	1, 128	0.16	.688
Condition * Baseline Completion	1, 128	2.32	.130

Group Comparison

Table 4 details the means and standard deviations for the intervention and control group at each assessment time point. Table 5 presents 2 X 3 mixed ANOVA results. Table 6 reports repeated-measure ANOVAs conducted separately on both conditions for those outcome variables that had a significant interaction effect.

Table 4.

Means and Standard Deviations by Group across Time

Outcome Variable	Baseline M (SD)	Post-treatment M (SD)	Follow-up M (SD)
Dieting - Unhealthy: WLBS-Unhealthy			
Control	1.78 (1.06)	1.78 (1.06)	1.7 (0.96)
Intervention	2.03 (1.24)$_a$	1.6 (0.66)$_b$	1.54 (0.79)$_b$
Dieting - Healthy: WLBS-Healthy			
Control	5.83 (1.53)	5.94 (1.30)	5.88 (1.47)
Intervention	5.53 (1.42)$_a$	4.59 (1.34)$_b$	4.74 (1.35)$_b$
Intuitive Eating –Extrinsic: IES-Extrinsic			
Control	2.67 (0.83)	2.60 (0.75)	2.65 (0.74)
Intervention	2.80 (0.78)$_a$	3.05 (0.80)$_b$	3.11 (0.84)$_b$
Intuitive Eating - Antidieting: IES-Antidieting			
Control	3.36 (0.82)	3.38 (0.86)	3.42 (0.78)
Intervention	3.37 (0.69)$_a$	3.86 (0.67)$_b$	3.88 (0.65)$_b$
Intuitive Eating - Self-care: IES-Self-care			
Control	3.65 (0.82)$_a$	3.74 (0.87)$_a$	3.59 (0.91)$_b$
Intervention	3.60 (0.76)$_a$	4.07 (0.66)$_b$	3.99 (0.68)$_b$
Body Image Dissatisfaction: BSQ-8C			
Control	3.02 (1.08)	2.90 (1.16)	2.91 (1.32)
Intervention	2.90 (1.17)$_a$	2.31 (1.08)$_b$	2.19 (1.01)$_b$
Eating Psychopathology: EAT-26			
Control	2.58 (0.59)	2.59 (0.6)	2.58 (0.64)
Intervention	2.40 (0.54)$_a$	2.16 (0.5)$_b$	2.07 (0.56)$_b$
Dietary intake: PS			
Control	9.76 (8.43)	10.89 (7.58)	11.06 (8.55)
Intervention	6.68 (8.63)$_a$	8.87 (7.63)$_b$	10.5 (7.33)$_b$
Anti-Fat Attitudes - Dislike: AAQ-Dislike			
Control	2.69 (1.77)$_{ab}$	2.53 (1.73)$_a$	2.76 (1.77)$_b$
Intervention	2.86 (1.77)$_a$	1.83 (1.21)$_b$	1.95 (1.16)$_b$
Anti-Fat Attitudes - Fear of Fat: AAQ-Fear of Fat			
Control	6.46 (2.17)	6.36 (2.37)	6.11 (2.48)
Intervention	6.09 (2.09)$_a$	4.45 (2.31)$_b$	4.61 (2.65)$_b$
Anti-Fat Attitudes - Willpower: AAQ-Willpower			
Control	5.70 (1.77)	5.47 (1.82)	5.21 (1.89)
Intervention	5.63 (1.97)$_a$	3.76 (2.2)$_b$	3.71 (1.97)$_b$
Mental Health-Related Quality of Life: SF-12 MCS			
Control	41.80 (10.06)	43.03 (10.88)	43.53 (10.32)
Intervention	43.43 (10.47)	45.75 (9.10)	46.31 (10.38)
BMI			
Control	23.32 (3.23)	23.26 (3.21)	23.22 (3.31)
Intervention	24.40 (4.59)	24.45 (4.76)	24.42 (4.84)
Knowledge			
Control	2.12 (1.25)$_a$	2.92 (1.13)$_b$	3.04 (1.23)$_b$
Intervention	1.96 (0.90)$_a$	4.11 (1.06)$_b$	3.91 (1.09)$_b$

Note. Non-matching subscript letters indicate significant differences between groups ($p < .05$).

Table 5.

2 X 3 (Mixed) ANOVA Examining Time and Time x Group Effects

Source	df	F	p	Partial η^2
Dieting - Unhealthy: WLBS-Unhealthy[a]				
Time	1.69, 157.46	7.89	.001	.078
Time x Group	1.69, 157.46	5.49	.008	.056
Dieting - Healthy: WLBS-Healthy				
Time	2, 186	6.53	.002	.066
Time x Group	2, 186	9.90	<.001	.096
Intuitive Eating - Extrinsic: IES-Extrinsic				
Time	2, 186	3.16	.045	.033
Time x Group	2, 186	5.31	.006	.054
Intuitive Eating - Antidieting: IES-Antidieting				
Time	2, 186	26.98	<.001	.225
Time x Group	2, 186	18.82	<.001	.168
Intuitive Eating - Self-care: IES-Self-care				
Time	2, 186	14.51	<.001	.135
Time x Group	2, 186	10.42	<.001	.101
Body Image Dissatisfaction: BSQ-8C				
Time	2, 184	18.89	<.001	.170
Time x Group	2, 184	9.73	<.001	.096
Eating Psychopathology: EAT-26				
Time	2, 186	10.66	<.001	.103
Time x Group	2, 186	10.96	<.001	.105
Dietary intake: PS				
Time	2, 186	10.64	<.001	.103
Time x Group	2, 186	2.52	.084	.026
Anti-Fat Attitudes - Dislike: AAQ-Dislike[a]				
Time	11.64, 149.18	13.8	<.001	.132
Time x Group	11.64, 149.18	10.65	<.001	.105
Anti-Fat Attitudes - Fear of Fat: AAQ-Fear of Fat				
Time	2, 182	18.53	<.001	.169
Time x Group	2, 182	11.05	<.001	.108
Anti-Fat Attitudes - Willpower: AAQ-Willpower				
Time	2, 182	39.37	<.001	.302
Time x Group	2, 182	18.27	<.001	.167
Mental Health-Related Quality of Life: SF-12 MCS[a]				
Time	1.82, 169.57	3.18	.049	.033
Time x Group	1.82, 169.57	0.22	.800	.002
BMI[a]				
Time	1.63, 151.63	0.34	.669	.004
Time x Group	1.63, 151.63	0.85	.428	.009
Knowledge				
Time	2, 176	104.81	<.001	.544
Time x Group	2, 176	18.45	<.001	.173

[a]Greenhouse-Geisser corrected univariate tests were reported when Mauchly's Test of Sphericity was significant

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Table 6.

Simple Time Effects by Condition on Variables that Showed a Time x Condition Interaction Effect

Outcome Variable	*df*	*F*	*p*	Partial η^2
Dieting - Unhealthy: WLBS-Unhealthy				
Control[a]	1.51, 79.77	0.72	.453	.013
Intervention	2, 80	6.93	.002	.148
Dieting - Healthy: WLBS-Healthy				
Control[a]	1.80, 95.44	0.26	.749	.005
Intervention	2, 80	13.51	<.001	.252
Intuitive Eating - Extrinsic: IES-Extrinsic				
Control	2, 106	0.47	.627	.009
Intervention	2, 80	6.01	.004	.131
Intuitive Eating - Antidieting: IES-Antidieting				
Control	2, 106	1.03	.359	.019
Intervention	2, 80	28.43	<.001	.415
Intuitive Eating - Self-care: IES-Self-care				
Control	2, 106	2.53	.085	.045
Intervention[a]	1.73, 69.27	20.54	<.001	.339
Body Image dissatisfaction: BSQ-8C				
Control	2, 106	0.96	.385	.018
Intervention[a]	1.48, 57.86	23.38	<.001	.375
Eating Psychopathology: EAT-26				
Control[a]	1.58, 83.93	0.07	.889	.001
Intervention	2, 80	13.26	<.001	.249
Anti-Fat Attitudes - Dislike: AAQ-Dislike				
Control[a]	1.64, 86.88	2.15	.132	.039
Intervention[a]	1.58, 60.01	12.74	<.001	.251
Anti-Fat Attitudes - Fear of Fat: AAQ-Fear of Fat				
Control	2, 106	1.64	.203	.030
Intervention	2, 76	20.18	<.001	.347
Anti-Fat Attitudes - Willpower: AAQ-Willpower				
Control	2, 106	4.53	.013	.079
Intervention	2, 76	34.11	<.001	.473
Knowledge				
Control	2, 102	21.68	<.001	.298
Intervention	2, 74	92.42	<.001	.714

[a]Greenhouse-Geisser corrected univariate tests were reported when Mauchly's Test of Sphericity was significant

Dieting. For the WLBS-Unhealthy subscale there was a significant time x condition effect revealed in the analysis. There was a statistically significant simple time effect for the intervention group, with a decrease in unhealthy dieting intention from baseline to post-treatment, $F(1, 40) = 7.35$, $p = .010$, partial $\eta^2 = .155$, and no significant difference from post-treatment to follow-up, $F(1, 40) = 0.33$, $p = .571$. On the other hand, there was no significant change across time in the control group. There were no significant differences between the control group and the intervention group at either post-treatment, $F(1,94) = 1.422$, $p = .297$, or follow-up, $F(1,94) = 0.92$, $p = .341$.

Similarly, there was a significant time x condition effect for the WLBS-Healthy subscale. In the intervention group, there was a statistically significant simple time effect, with a decrease in healthy dieting intention from baseline to follow-up, $F(1, 40) = 18.77$, $p < .001$, partial $\eta^2 = .319$, and no difference from post-treatment to follow-up, $F(1, 40) = 0.91$, $p = .347$. There was no statistically significant simple time effect found in the control group. Compared to the control group, the intervention group reported significantly lower unhealthy dieting intention at both post-treatment, $F(1,94) = 25.34$, $p < .001$, partial $\eta^2 = .212$, and follow-up, $F(1,93) = 14.79$, $p < .001$, partial $\eta^2 = .137$. These results indicate that in comparison to control, the intervention produced significantly greater decreases in healthy dieting intention that were maintained at follow-up.

Intuitive eating. The IES subscales showed similar results, with significant time by condition effects on the Extrinsic, Antidieting, and Self-care subscales. On the IES-Extrinsic subscale, in the intervention group, there was a significant simple time effect, with an increase on scores from baseline to post-treatment, $F(1, 40) = 6.84$, $p = .013$, partial $\eta^2 = .146$, indicating a decrease in eating according to external cues. Also, in the intervention group, there was no significant change from post-treatment to follow-up, $F(1, 40) = 0.43$, $p = .514$. There was no significant simple time effect in the control group. IES-Extrinsic scores were higher in the intervention group at both post-treatment, $F(1, 94) = 8.62$, $p = .004$, partial $\eta^2 = .084$, and follow-up, $F(1, 93) = 7.851$, $p = .006$, partial $\eta^2 = .078$.

Similarly, on the IES-Antidieting subscale, there was no simple time effect in the control group, but there was a significant simple time effect in the intervention group,

with a significant increase from baseline to post-treatment, $F(1, 40) = 37.41, p < .001$, partial $\eta^2 = .48$, and no significant change from post-treatment to follow-up, $F(1, 40) = 0.13, p = .721$. IES-Antidieting scores were higher in the intervention group than the control group at post-treatment, $F(1, 94) = 8.63, p = .004$, partial $\eta^2 = .084$, and follow-up, $F(1, 93) = 9.034, p = .003$, partial $\eta^2 = .089$.

Finally, on the IES-Self-care subscale, there was again no simple time effect in the control group, and a significant simple time effect in the intervention group. In the intervention group, there was a significant increase in IES-Self-care scores from baseline to post-treatment, $F(1, 40) = 28.05, p < .001$, partial $\eta^2 = .412$, and no significant change from post-treatment to follow-up, $F(1, 40) = 1.96, p = .170$. The intervention group and control group did not differ significantly at post-treatment, $F(1, 94) = 3.85, p = .053$, but the intervention reported higher IES-Self-care scores at follow-up, $F(1, 94) = 5.61$, $p = .020$, partial $\eta^2 = .057$.

Body image dissatisfaction. In a similar pattern, BSQ-8C analysis showed a significant time x condition effect. There was a simple time effect for the intervention group, with a significant decrease in body image dissatisfaction between baseline and post-treatment, $F(1, 39) = 24.73 , p < .001$, partial $\eta^2 = .388$, and no significant difference between post-treatment and follow-up, $F(1, 39) = 2.51, p = .122$. Compared to the control, participants in the intervention reported significantly less body image dissatisfaction at post-treatment, $F(1, 92) = 6.26, p = .014$, partial $\eta^2 = .064$, and follow-up, $F(1, 93) = 8.38, p = .005$, partial $\eta^2 = .083$. These findings indicate that the intervention produced significant improvements in body image dissatisfaction compared to the control that were maintained at follow-up.

Eating concerns. Analysis of the EAT-26 revealed a significant time x condition interaction. Whereas there was no significant simple time effect for the control group, there was a significant simple time effect for the intervention group, with a significant decrease between baseline and post-treatment, $F(1, 40) = 13.50, p = .001$, partial $\eta^2 = .252$, and no significant difference between post-treatment and follow-up, $F(1, 40) = 1.60, p = .214$. Eating concerns were significantly lower in the intervention group compared to the control group at post-treatment, $F(1, 93) = 13.97, p < .001$, partial $\eta^2 = .131$, and follow-up, $F(1, 93) = 15.95, p < .001$, partial $\eta^2 = .146$. These results

indicate that the intervention produced significantly greater reductions in eating concerns than the control group, and that these effects were maintained through follow-up.

Dietary intake. For the PS, analysis revealed a significant time effect, but no time x condition interaction. All participants reported a signficant improvement in dietary intake from baseline to post-treatment, $F(1, 93) = 10.84$, $p = .001$, partial $\eta^2 = .104$, with no significant difference from post-treatment to follow-up, $F(1, 93) = 2.64$, $p = .108$. There was no significant main group effect, $F(1, 93) = 156.54$, $p = .223$. This indicates that participants as a whole reported improved dietary intake over time, but that there was no significant effect on dietary intake produced by the intervention compared to control.

Anti-fat attitudes. On all three AAQ subscales, Dislike, Fear of Fat, and Willpower, analyses indicated signficant time x condition interactions. In the intervention group there was a signficant simple time effect on Dislike, and there was no significant time effect in the control group. In the intervention group, there was a significant reduction on the Dislike subscale from baseline to post-treatment, $F(1, 38) = 19.41$, $p < .001$, partial $\eta^2 = .338$, and no significant change from post-treatment to follow-up, $F(1, 38) = 0.52$, $p = .477$. On AAQ-Dislike, the intervention group reported significantly lower Dislike scores at both post-treatment, $F(1, 94) = 5.20$, $p = .025$, partial $\eta^2 = .052$, and follow-up, $F(1, 93) = 7.24$, $p = .008$, partial $\eta^2 = .072$, compared to the control group. This indicates that the intervention produced a significant reduction in attitudes of dislike of fat people compared to the control condition, and these effects were maintained at follow-up.

Similarly, on the Fear of Fat subscale, there was a significant simple time effect for the intervention group, and no significant simple time effect in the control group. In the intervention group, there was a significant reduction on the Fear of Fat subscale from baseline to post-treatment, $F(1, 38) = 34.45$, $p < .001$, partial $\eta^2 = .475$, and there was no significant change from post-treatment to follow-up, $F(1, 38) = 0.34$, $p = .561$. Compared to the control group, the intervention group reported significantly lower Fear of Fat scores at post-treatment, $F(1, 94) = 15.05$, $p < .001$, partial $\eta^2 = .138$, and follow-up, $F(1, 93) = 8.57$, $p < .001$, partial $\eta^2 = .084$. These findings indicate that, compared to

the control condition, the intervention produced a reduction in fear of fat from baseline to post-treatment that was maintained at follow-up.

In a slightly different pattern, on the Willpower subscale, there were significant simple time effects found in both the intervention group and control group. In the intervention group, there was a significant reduction on Willpower scores from baseline to post-treatment, $F(1, 38) = 43.79$, $p < .001$, partial $\eta^2 = .535$, and no significant change from post-treatment to follow-up, $F(1, 38) = 0.04$, $p = .835$. On the other hand, in the control group there was no significant change in scores from either baseline to post-treatment, $F(1, 53) = 1.95$, $p = .168$, or post-treatment to follow-up, $F(1, 53) = 3.31$, $p = .074$. The intervention group reported significantly lower Willpower scores at post-treatment, $F(1, 94) = 18.49$, $p < .001$, partial $\eta^2 = .164$, and follow-up, $F(1, 93) = 15.63$, $p < .001$, partial $\eta^2 = .144$. This indicates that the intervention condition produced a significant reduction in attribution of fatness to lack of willpower, and that these effects were maintained at follow-up.

Mental health-related quality of life. Analysis of the SF-12 MCS revealed no time x condition interaction and a significant but small time effect. However, contrasts did not find significant effects for either baseline to post-treatment, $F(1, 93) = 3.89$, $p = .052$ or post-treatment to follow-up, $F(1, 93) = 0.40$, $p = .531$. There was also no significant main group effect, $F(1, 93)$, $p = .193$. Thus a small improvement in mental health-related quality of life was seen overall among participants, but this effect did not differ by condition.

BMI. Although no significant effects on BMI were predicted in this study, this variable was also examined. As expected, no significant time effect or time x condition interaction were revealed, indicating that this study did not significantly affect participants' BMI. There was also no significant main group effect, $F(1, 93) = 2.00$, $p = .161$.

Knowledge. For knowledge scores (measuring knowledge of the effects of dieting and healthy eating guidelines), there was a significant time x condition interaction. There were significant simple time effects for both the intervention group and control group. Significant increases in knowledge from baseline to post-treatment were found for both the intervention group, $F(1,37) = 161.37$, $p < .001$, partial $\eta^2 = .813$,

and the control group, $F(1, 51) = 29.76$, $p < .001$, partial $\eta^2 = .369$, with the intervention group showing greater knowledge than the control group at post-treatment, $F(1,92) = 27.73$, $p < .001$, partial $\eta^2 = .232$. There was no significant difference in knowledge scores between post-treatment and follow-up in either the intervention group, $F(1, 37) = 1.38$, $p = .255$, or control group, $F(1, 51) = 0.62$, $p = .434$, and there remained a significant difference in scores between intervention and control at follow-up, $F(1,93) = 14.04$, $p < .001$, partial $\eta^2 = .131$.

Program Feedback

Table 8 reports frequencies of responses to feedback questions that were given to participants at follow-up. Results from participants in the intervention condition are summarized here.

Incorporation. The majority of respondents reported that they incorporated what they learned from the intervention into their lives (93%), thought about the things that they learned in the study (91%), and talked about the things that they learned with other people (74%). In addition, 93% of respondents reported that they learned new information and 91% reported that they enjoyed the study.

Healthy eating. The majority of participants reported that the study made them want to eat more healthfully (88%) and feel more capable of eating healthfully (90%). The majority of participants also stated that due to participation in the study they now ate more healthfully (71%), although a sizable portion disagreed (12%). Participants were asked to identify barriers to eating healthfully, and 73% reported that participation in the study helped them address these difficulties.

Dieting mentality. Similarly, most participants stated that participating in the study made them want to reject the dieting mentality (88%) and feel more capable of doing so (83%). The majority of participants reported that they were less likely to diet now (76%). The majority (65%) of participants also reported that the study helped them to address barriers to rejecting the dieting mentality.

Table 7.
Responses to Feedback Questions by Condition

Question	Intervention		Control	
	n	*%*	*n*	*%*
I incorporated what I learned in the *Inside Out Study* into my life.				
Strongly disagree	0	0.0%	2	3.7%
Disagree	0	0.0%	3	5.6%
Somewhat disagree	1	2.4%	2	3.7%
Neutral	2	4.8%	9	16.7%
Somewhat agree	14	33.3%	28	51.9%
Agree	17	40.5%	5	9.3%
Strongly agree	8	19.0%	5	9.3%
I think about the things I learned in the *Inside Out Study*.				
Strongly disagree	1	2.4%	2	3.7%
Disagree	0	0.0%	4	7.4%
Somewhat disagree	0	0.0%	6	11.1%
Neutral	3	7.1%	2	3.7%
Somewhat agree	14	33.3%	25	46.3%
Agree	14	33.3%	10	18.5%
Strongly agree	10	23.8%	5	9.3%
I talk about the things I learned in the *Inside Out Study* with other people.				
Strongly disagree	2	4.8%	4	7.4%
Disagree	1	2.4%	12	22.2%
Somewhat disagree	1	2.4%	5	9.3%
Neutral	7	16.7%	10	18.5%
Somewhat agree	11	26.2%	16	29.6%
Agree	10	23.8%	4	7.4%
Strongly agree	10	23.8%	3	5.6%
The *Inside Out Study* taught me new information.				
Strongly disagree	1	2.4%	2	3.7%
Disagree	1	2.4%	2	3.7%
Somewhat disagree	1	2.4%	5	9.3%
Neutral	0	0.0%	4	7.4%
Somewhat agree	11	26.2%	19	35.2%
Agree	16	38.1%	15	27.8%
Strongly agree	12	28.6%	7	13.0%
I enjoyed the *Inside Out Study*.				
Strongly disagree	0	0.0%	2	3.7%
Disagree	0	0.0%	1	1.9%
Somewhat disagree	2	4.8%	2	3.7%
Neutral	2	4.8%	8	14.8%
Somewhat agree	7	16.7%	19	35.2%
Agree	17	40.5%	13	24.1%
Strongly agree	14	33.3%	9	16.7%
The *Inside Out Study* made me **want** to eat more healthfully.				
Strongly disagree	0	0.0%	1	1.9%
Disagree	0	0.0%	0	0.0%
Somewhat disagree	0	0.0%	0	0.0%
Neutral	5	12.2%	6	11.1%
Somewhat agree	5	12.2%	23	42.6%
Agree	17	41.5%	16	29.6%
Strongly agree	14	34.1%	8	14.8%

Note. Includes responses from one participant who missed baseline assessment but completed the study.

Table 7. (Continued)
Responses to Feedback Questions by Condition

Question	Intervention		Control	
	n	*%*	*n*	*%*
The *Inside Out Study* made me feel **more capable** of eating healthfully.				
Strongly disagree	0	0.0%	2	3.7%
Disagree	1	2.4%	1	1.9%
Somewhat disagree	1	2.4%	0	0.0%
Neutral	2	4.9%	9	16.7%
Somewhat agree	10	24.4%	19	35.2%
Agree	13	31.7%	15	27.8%
Strongly agree	14	34.1%	8	14.8%
Due to my participation in the *Inside Out Study*, I eat more healthfully now.				
Strongly disagree	2	4.9%	2	3.7%
Disagree	1	2.4%	3	5.6%
Somewhat disagree	2	4.9%	7	13.0%
Neutral	7	17.1%	14	25.9%
Somewhat agree	11	26.8%	14	25.9%
Agree	11	26.8%	9	16.7%
Strongly agree	7	17.1%	5	9.3%
The Inside Out Study helped me to address [participant's identified difficulties with eating healthfully].				
Strongly disagree	2	5.0%	1	2.0%
Disagree	0	0.0%	2	3.9%
Somewhat disagree	1	2.5%	8	15.7%
Neutral	8	20.0%	16	31.4%
Somewhat agree	16	40.0%	18	35.3%
Agree	8	20.0%	4	7.8%
Strongly agree	5	12.5%	2	3.9%
The *Inside Out Study* made me **want** to reject the dieting mentality (i.e. not diet).				
Strongly disagree	0	0.0%	2	3.8%
Disagree	1	2.4%	3	5.7%
Somewhat disagree	0	0.0%	11	20.8%
Neutral	4	9.5%	19	35.8%
Somewhat agree	11	26.2%	10	18.9%
Agree	14	33.3%	4	7.5%
Strongly agree	12	28.6%	4	7.5%
The *Inside Out Study* made me feel **more capable** of rejecting the dieting mentality.				
Strongly disagree	0	0.0%	2	3.7%
Disagree	1	2.4%	2	3.7%
Somewhat disagree	1	2.4%	7	13.0%
Neutral	5	11.9%	21	38.9%
Somewhat agree	7	16.7%	13	24.1%
Agree	12	28.6%	6	11.1%
Strongly agree	16	38.1%	3	5.6%

Note. Includes responses from one participant who missed baseline assessment but completed the study.

Table 7. (Continued)
Responses to Feedback Questions by Condition

	Intervention		Control	
Question	n	%	n	%
Due to my participation in the *Inside Out Study*, I reject the dieting mentality and am less likely to diet now.				
Strongly disagree	0	0.0%	3	5.7%
Disagree	0	0.0%	4	7.5%
Somewhat disagree	2	4.8%	10	18.9%
Neutral	8	19.0%	19	35.8%
Somewhat agree	5	11.9%	5	9.4%
Agree	12	28.6%	9	17.0%
Strongly agree	15	35.7%	3	5.7%
The *Inside Out Study* helped me to address [participant's identified difficulties with rejecting the dieting mentality]				
Strongly disagree	0	0.0%	0	0.0%
Disagree	1	2.5%	2	3.8%
Somewhat disagree	0	0.0%	2	3.8%
Neutral	13	32.5%	27	51.9%
Somewhat agree	7	17.5%	11	21.2%
Agree	8	20.0%	5	9.6%
Strongly agree	11	27.5%	5	9.6%

Note. Includes responses from one participant who missed baseline assessment but completed the study.

Table 8 reports means and differences for the control and intervention subscales overall and for each subscale. There were significantly more positive responses in the intervention group on the overall feedback summary score, as well as the Incorporation, Healthy Eating, and Rejection of Dieting Mentality subscales.

Table 8.
Between Group Differences on Feedback Scales

	Control	Intervention			
	M (SD)	*M (SD)*	*df*	*t*	*p*
Feedback Summary Score	4.62 (0.90)	5.63 (0.89)	93	-5.40	<.001
Incorporation	4.7 (1.28)	5.66 (1.03)	93	-3.96	<.001
Healthy Eating	4.88 (1.00)	5.50 (0.94)	92	-3.05	.003
Dieting Mentality	4.28 (1.18)	5.70 (1.09)	93	-6.05	<.001

Note. Includes responses from one participant who missed baseline assessment but completed the study.

Discussion

The purpose of this study was to examine whether a brief non-dieting intervention would be acceptable to and effective in a sample of college women. Overall, this intervention was well-received and produced significant changes in dieting intention, intuitive eating, body image dissatisfaction, eating concerns, and anti-fat attitudes compared to a relatively active control condition.

Dieting

Compared to the control condition, the intervention condition produced significant decreases in both unhealthy and healthy dieting intention. These changes were maintained at follow-up. Of note, the WLBS-Healthy subscale includes items that are generally considered adaptive and were recommended by the program, such as increasing exercise and increasing fruit and vegetable intake, but the measure asks about these behaviors specifically for the purpose of losing weight. As will be described further below, participants overall reported an increase in healthy dietary intake, providing some support that this measure is examining intention to change behavior in order to lose weight and does not necessarily reflect a decrease in behaviors such as consumption of fruits and vegetables and exercise. The effects on dieting intention are promising, as dieting is a risk factor for the development of eating disorders (Stice, Marti, & Durant, 2011) and has been associated with depression and poorer self-esteem in college samples (Ackard et al., 2002). In addition, it has been found that dieting predicts increases in BMI in adolescents (Neumark-Sztainer, Wall, Larson, Eisenberg, & Loth, 2011), and dieting in college freshmen is the strongest predictor of weight gain over the first year of college (Lowe et al., 2006). Thus, a reduction in dieting intention may result in lowered likelihood of developing eating disorders and other psychosocial impairment, as well prevent unhealthy weight fluctuations related to dieting.

Intuitive Eating

This intervention also produced effects compared to the control condition on the Intuitive Eating Scale. Compared to the control condition, participants in the intervention condition reported a significant decrease in eating based on external cues, an increase in antidieting attitudes, and an increase in self-care orientation. These effects were maintained at follow-up. Intuitive eating is argued to be an adaptive style of eating, and

studies have found that it is associated with lower BMI, lower dietary restraint, and greater enjoyment and pleasure in eating (Denny, Loth, Eisenberg, & Neumark-Sztainer, 2013; Hawks, Madanat, Hawks, & Harris, 2005; Tylka & Wilcox, 2006). This study provides an important step forward in the literature in that it identifies that intuitive eating may be affected through a brief intervention, and it is the first study that we are aware of to use a validated measure of intuitive eating in a randomized-controlled trial (Schaefer & Magnuson, 2014).

Body Image Dissatisfaction

There was also a decrease in body image dissatisfaction in the intervention group compared to the control group at post-treatment, which was maintained at follow-up. This is noteworthy as body image was one of the target areas of the brochure control. Other brief dissonance-based interventions have also produced similar improvements in body image; however, these body image interventions focused on critiquing and fostering a rejection of the western thin body ideal (Becker, Ciao, & Smith, 2008; Stice et al., 2012), whereas the present intervention focused on promoting acceptance of current body size through education on set-point theory and the problematic effects of dieting.

Decreased body dissatisfaction has been associated with improved mental and physical health (Muennig et al., 2008; R. E. Wilson et al., 2013) and reduced risk of developing eating psychopathology (Stice et al., 2011). Improvements in body image have also been linked to weight maintenance over time (Gagnon-Girouard et al., 2010). Thus, the reductions in body image dissatisfaction seen in this study may contribute over time to reduced incidence of eating disorders, greater weight stability, and improved mental and physical health.

Eating Concerns

Perhaps one of the most encouraging findings was that this intervention reduced potentially problematic eating concerns, and this effect was maintained at follow-up. Although eating psychopathology was not explicitly targeted in this study, a number of risk factors for eating psychopathology, such as dieting and body image dissatisfaction were targeted, and we speculate that improvements in these areas mediate the improvements in eating concerns. Because participants with very high levels of eating concerns were excluded from this study, whether or not these benefits would generalize

to an eating disordered population is unclear; however, similar studies on high-risk populations indicate that we might expect to see even stronger effects with higher baseline levels of eating psychopathology (Stice, Rohde, Gau, & Shaw, 2009; Stice et al., 2007).

Dietary Intake

Both the intervention and control groups reported healthier dietary intake at post-treatment that was maintained at follow-up, but the intervention did not produce stronger effects than the control intervention. One caveat of these findings is that dietary intake is particularly difficult to measure, and there are no brief self-report measures which have demonstrated a high degree of validity. Nevertheless, it is interesting that there were significant improvements in the control group. The brochure control condition provided specific content related to the USDA MyPlate, and it may be that information is sufficient to produce improvements in dietary quality. This may particularly be the case in young adults who may have limited knowledge in this area. The knowledge questions revealed that, in this sample, most participants at baseline did not know about the MyPlate guidelines. If this is the case, a future study could examine whether the intervention could be simplified and supplemental educational material provided regarding dietary guidelines. Interestingly, the other brochure focused on body image, but there were no significant effects on body image in the control group. It may be that attitudes such as body image dissatisfaction are less likely to change through information alone, or it may be that participants at baseline had more familiarity with the information regarding body image than they did regarding the MyPlate guidelines, and thus this information was more likely to result in behavioral changes.

Anti-Fat Attitudes

The intervention condition also produced significant reductions in anti-fat attitudes compared to the control condition. There were significant decreases in dislike of fat people, fear of becoming fat, and attribution of fatness to lack of willpower in the intervention group compared to the control group at post-treatment, and these effects were maintained at follow-up. The control group also showed a significant simple time effect on the Willpower subscale, but the change from baseline to post-treatment on this subscale was not significant, suggesting that this effect was relatively modest. The

finding that anti-fat attitudes can be reduced in a brief intervention is particularly noteworthy, as weight bias is common in the college-aged population (Janet D. Latner, Stunkard, & Wilson, 2005), and interventions to reduce weight bias have shown limited success (Ciao & Latner, 2011). That weight bias can be reduced in conjunction with reducing body image dissatisfaction and eating concerns suggests that addressing weight bias could positively impact individual body acceptance. There is a great deal of condemnation and judgment involved in weight bias, and it may be that reducing weight bias towards others facilitates more allowance for body diversity within individuals.

Mental Health-Related Quality of Life

There was no clear effect on mental health-related quality of life produced by the intervention in comparison to the control. There was a significant main time effect, in which overall there was an improvement in mental health-related quality of life across time; however, this effect was small, and contrasts did not reveal a significant increase from either baseline to post-treatment or post-treatment to follow-up. In other brief dissonance studies that focused on body image, mixed effects were found on measures of psychosocial functioning not directly related to eating or weight issues. For example, Becker et al. (2010) reported improvements on negative affect that were consistent with other study outcomes such as body image dissatisfaction, whereas other studies that measured depression have reported no improvements (Ciao, 2013) or did not report results on this measure (Stice et al., 2009). Similarly, among non-dieting interventions, effects on psychosocial functioning outside of the domains of eating and weight were also varied, with one study finding significant improvements in depression and anxiety produced by the non-dieting intervention (Tanco et al., 1998), while two other studies found improvements in depression (Bacon et al., 2002, 2005) and perceived stress in both non-dieting and dieting conditions (Rapoport et al., 2000). Measure selection might account for some of the differences in findings; for example, a measure of negative affect may better capture those effects related to improvements in the domains of eating behaviors and body image dissatisfaction, compared to a more specific measure such as a depression scale. Another factor to consider is length of intervention, in the non-dieting studies, the interventions were much longer, between 2-6 months in length, which may be able to better reflect changes to depression and mental health related functioning. The

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results here suggest that there may be a small benefit to mental health-related quality of life through participation in this intervention, but no greater than that seen in participation in the brochure control. However, there is some research suggesting that body image and eating psychopathology are risk factors for the development of depression (Stice, Hayward, Cameron, Killen, & Barr Taylor, 2000; Stice, 2001), thus if the improvements in these areas are maintained over time, there may be a preventative effect on the development of depression and impairment in functioning related to mental health.

Knowledge

Both conditions included educational content, but although the brochures conveyed knowledge to participants, more knowledge was gained through the intervention. This finding is unsurprising given the more in-depth and interactive presentation of information in the intervention condition.

Program Acceptability

Overall, this intervention appeared to have been well received. One positive indication is that attrition rates for those who attended baseline were low and did not differ by condition. In addition, feedback given by the intervention group was very positive. Respondents in the intervention group indicated that they learned new information and thought about and incorporated this information into their lives. Most reported increased desire and capability to eat healthfully, concurrent with increased desire and ability to reject the dieting mentality.

Given the prevalence of the dieting mentality, one research question was whether college women would be receptive to critiquing the dieting mentality. Notably, on the dieting mentality feedback questions, participants in the intervention gave the overall highest ratings (indicating rejection of the dieting mentality) and showed the largest difference in ratings from the control group. For example, a large majority (76%) of participants in the intervention group agreed that due to participating in the study they rejected the dieting mentality and were less likely to diet, while only 5% disagreed. This indicates that college women are very receptive to critiques of the dieting mentality; however, because women reporting high levels of eating psychopathology were excluded from the study, the acceptability of this content in a higher-risk population is unknown.

Limitations

      Brief intervention. This was a relatively brief intervention, totaling only four hours. A more intensive treatment would have allowed for more in-depth coverage of topics such as intuitive eating and the integration of other areas integral to the Health-at-Every-Size approach, such as physical activity. This in turn may have produced stronger effects. Some participants expressed a desire for more sessions, suggesting that for at least a subset of participants a longer intervention would be preferable. At the same time, given the preventative focus of this intervention, a brief format is likely to be more tolerable, cost-effective, and easily implemented broadly.

      Self-report. An important consideration is that, with the exception of height and weight, all of the measures used in this study were self-report. The use of self-report measures could introduce reporter bias, for example, through difficulties in recall, impression management, and self-deceptive enhancement. Thus, it is unclear to what degree these reported changes translate to behaviors such as eating more fruits and vegetables and refraining from unhealthy dieting behaviors. For example, social desirability has been shown to affect self-report on dietary intake measures (Hebert, Clemow, Pbert, Ockene, & Ockene, 1995). In addition, due to the nature of the more extensive involvement, it is possible that there were perceived greater demand characteristics in the intervention group that could have influenced participant report. Studies generally attempt to look at this issue by using a social desirability measure (Crowne & Marlowe, 1960; Paulhus, 1991); in this case no social desirability measure was used in order to minimize study burden on participants.

      It should also be noted that some of the data collected at follow-up were gathered using an online survey. Although survey data gathered online is generally considered comparable to those gathered in person (Gosling, 2004), the impact on measures of weight and knowledge should be considered. Self-weighing introduces error through the use of a different scale and the potential misreporting of weight either purposefully, due to misremembering, or due to a delay between weighing and reporting. In order to ameliorate the latter, participants who completed the follow-up online were asked complete the assessment when they had access to a scale and could weigh themselves. Because weight was not predicted to be impacted in this study and in order to be able to

retain as many participants for follow-up as possible, using self-reported weight at follow-up was deemed acceptable for this study. Regarding the knowledge measure, there could also be error introduced if participants completing the follow-up survey online chose to look up the answers to the knowledge questions. The directions asked participants not to do so, but no measure of compliance to this instruction was gathered.

Study design. A major limitation of this study was that the design involved randomization prior to collection of baseline data. This was done for logistical reasons in order to be able to allocate more potential participants and reduce the number of in-person visits in order to reduce the study's time demands on participants. Unfortunately, there was a great deal of attrition between allocation and baseline, and this attrition occurred differentially between the control group and the intervention group. Notably, there were important differences between the demands of participating in the control versus intervention, specifically, participants in the intervention needed to attend two sessions lasting two hours at a scheduled time, whereas the control group participants could select two times within lab hours lasting no longer than an hour each. Although every effort was made to retain all participants, including moving intervention participants to another scheduled group if necessary, those in the intervention group who dropped out of the study before baseline largely attributed doing so to scheduling problems or being too busy. The biggest problem with differential attrition is that it might have created fundamental differences between the two conditions. In order to examine this, both conditions were compared on all baseline variables at baseline, and no significant differences emerged.

Given that there were no significant differences found between the groups at baseline, and in light of the scheduling problems identified by dropouts, it seems likely that the primary reason for the differential attrition was the difference in the study demands by condition. Of course, this raises the question of whether there were differences in the characteristics of the two conditions that were not measured. For example, there could foreseeably be higher average levels of interest or conscientiousness, or simply less busy schedules in the intervention group compared to the control group. These differences could then impact study results; higher conscientiousness could result in greater accumulation of knowledge over the course of

the study, or a less busy schedule could make it easier to implement dietary changes. As it is not possible to account for these possibilities, the study's results must be qualified.

A second limitation related to the pre-baseline attrition is that due to not having baseline data for 25.0% of participants who were allocated, an intent-to-treat analysis could not be conducted. In clinical studies, intent-to-treat analyses are considered important in ascertaining the true effectiveness of an intervention. This is for two main reasons, one is that participants for whom the intervention is not effective are typically more likely to drop out from the study, and if only completers are included, any treatment effects are likely to be overestimated. Regarding the first point, in this case, most of the attrition occurred prior to any treatment (25.0% before baseline, versus 3.0% between baseline and post-treatment, and 2.1% between post-treatment and follow-up), and drop-out after baseline was very similar in both conditions (4.7% in the intervention group and 5.4% in the control group). Regarding the second point, there were no significant differences in results run with completers versus baseline carried forward, which generally is a more conservative approach, suggesting that results were not overestimated in this case.

Scope of intervention. Finally, the focus of this intervention is primarily on individual factors, when there is a great deal of literature suggesting that sociological and environmental variables are important contributors to eating and weight disturbance. For example, the obesogenic environment, cultural thin-ideal, and prevalence of dieting messages play powerful roles in the development of obesity and eating psychopathology. This is noted as a limitation because in focusing on the individual without addressing the macro factors, this intervention may have the effect of perpetuating the societal tendency of attributing the development of eating and weight disturbance primarily to the individual.

Future Directions

Longer follow-up. It is promising that effects were maintained at the one-month follow-up point, suggesting that these effects may have a long-term duration. A next step would be to assess long-term effects directly through a greater length of follow-up. Bacon and colleagues (2005) found that a HAES intervention showed sustained beneficial effects on blood pressure, restrained eating, body image, eating concerns, and

self-esteem at the 2 year follow-up. Similarly, in dissonance-based, thin-ideal interventions, longer follow-up have shown positive effects on body image dissatisfaction and eating psychopathology even after two years of participation in the brief intervention, and that participation in the intervention can result in reduced eating disorder onset (Stice, 2013). These findings suggest that the effects of non-dieting and dissonance-based interventions can be maintained over time.

Of particular interest would be whether or not this program has any preventative effects. For example, it is possible that a program that prevents unhealthy dieting could reduce weight fluctuations and improve health over time, which could be assessed through physiological measures such as blood pressure and cholesterol measures over a period of two to five years. Weight cycling has been associated with worse health and possibly increased mortality (Diaz, Mainous, & Everett, 2005; Ernsberger & Koletsky, 1999). A promising potential effect of adopting intuitive eating styles early is preventing excess weight gain by facilitating adherence to the body's internal hunger and satiety signals rather than external cues of eating. Thus, although there were no BMI effects found over the course of five weeks, as a result of the intervention, BMI may show more long-term stability over a longer follow-up period.

Longer follow-up would also be able to ascertain if there is continued improvement in the factors impacted by the intervention. For example, the intervention focused on helping participants to learn how to adapt nutrition recommendations to their own needs, this might result in increased ability to learn about and apply the recommendations, resulting in differential improvements over time. A promising trend was that on three of the main measures - eating concerns, body image dissatisfaction, and intuitive eating - changes had further increased at follow-up, although these increases were not statistically significant.

Applications to other populations. Future studies could examine the applications to a broader population. For example, men were not included in this study, but rates of overweight and obesity have been rising in men (Wang & Beydoun, 2007), and young adult men may also practice behaviors to lose weight or conform to body ideals that are unhealthy or counterproductive, such as taking steroids (Cafri et al., 2005). Thus, male participants might benefit from an adapted version of this intervention.

In addition, women reporting high levels of eating psychopathology were excluded, due to the concern that this study would not be the right level of care for these individuals and that their inclusion in the groups could negatively impact the discussions. However, given that this intervention has shown positive effects on body image dissatisfaction, dieting intention, and eating concerns, it could also be of benefit to people reporting higher levels of eating psychopathology.

This study also did not examine whether this program could benefit women classified as underweight according to their BMI. There was interest expressed by women of this size, and the principles of healthy eating and rejection of the dieting mentality would be applicable to this group as well. In one study of the general U.S. population, 40% of females who perceived themselves as underweight or normal weight desired to lose weight and 42% were dieting (Yaemsiri, Slining, & Agarwal, 2011). In this study, it seemed to be helpful to have women of a range of sizes in the groups, for example, one woman with a higher BMI commented, "As a larger person, it was nice to find out that these skinny girls have body issues too," and being fully inclusive could reinforce the message that healthy eating and body acceptance is important for everyone, regardless of size.

In addition, this study restricted age to 18-30. Given that at all ages dieting in women remains common and healthy eating practices arguably become even more important later in life, studying the effects in an older population would be beneficial. Moreover, it is well established that adolescence is a time in which dieting behavior is very common and adolescent girls are particularly vulnerable to the development of eating disorders, thus, studying this intervention in adolescents would be an important next step.

Group leaders. Although larger effect sizes are typically found with professional providers (Stice et al., 2007), in several effectiveness trials, health educators (Matusek, Wendt, & Wiseman, 2004), school staff (Stice et al., 2011), and college (Becker, Bull, et al., 2008; Becker, Smith, & Ciao, 2006) and high school (Ciao, 2013) peers have effectively led brief dissonance-based groups. In the case of peer leaders, the training and group leading process can produce improvements on study measures within the peer leaders as well (Becker, Bull, et al., 2008). Future studies could similarly examine the

effectiveness of non-professional and endogenous group leaders in providing this non-dieting intervention, which would help to establish avenues for sustainable dissemination.

Summary

This study provides support that a brief non-dieting intervention can be both acceptable to and benefit college women by reducing dieting intention, increasing intuitive eating, decreasing body image dissatisfaction, decreasing eating concerns, and reducing anti-fat attitudes. If these effects are sustained, over time additional benefits could emerge such as decreased incidence of eating disorders and increased weight stability.

Applying the Health-at-Every-Size approach to young women of all sizes may itself have important benefits. This is a natural extension of the weight neutral principles of the Health-at-Every-Size approach. Women across the BMI spectrum operate within the larger macroenvironment that is conducive to poor food selection, eating beyond satiety, and low levels of physical activity (Horgen & Brownell, 2002). Moreover, this environment contains prevalent weight-bias (Puhl & Heuer, 2009), pressures to be thin, and messages encouraging dieting (Whisenhunt, Williamson, Netemeyer, & Andrews, 2003), to which college women are particularly susceptible (Malinauska, Raedeke, Aeby, Smith, & Dallas, 2006). As a result, college women at all sizes frequently report poor eating habits, low levels of physical activity, and attempts to lose weight even when not overweight (Harring, Montgomery, & Hardin, 2010). Addressing these issues with college women at a range of sizes may help to clarify the distinction between weight and health. By explicitly targeting the conflation of weight and health, we may be able to engender a more individualized conceptualization of health and healthy lifestyle, which in turn may be both more appropriate to the individual and foster more sustainable health behaviors. For example, women who link exercise to weight loss may become discouraged if weight loss does not follow, as it typically does not (Wing, 1999). On the other hand, if health and wellness are the priorities, the benefits of physical activity are clear regardless of change in weight. Moreover, bringing together women of various sizes and highlighting their similarities may help to increase social support and reduce weight stigma, which could have a broader impact on health and well-being.

Eligibility Questionnaire

Thank you for your interest in our study. Please fill out the following survey as completely as possible.

General Information

Age:

Gender: Male   Female   Other *specify*:

Are you pregnant or currently trying to become pregnant? yes   no

Have you given birth within the last 6 months? yes   no

Last four # of student ID: _ _ _ _

Last four # of phone: _ _ _ _

Name:

E-mail:

Phone:

Please give your best guess as to how many semesters you have left until graduation:

1; 2 (1 year); 3; 4 (2 years); 5; 6 (3 years); 7; 8 (4 years); 9; 10 (5 years); 11; 12 (6 years); other:

What is your current weight? (Even if you aren't very sure, please provide the best estimation that you can.) *Please specify pounds or kilograms.*

What is your current height? (Even if you aren't very sure, please provide the best estimation that you can.) *Please specify feet or centimeters.*

Availability

During the study, you will be asked to attend three sessions at UH Manoa, each one week apart. Please indicate which series of sessions you would be able to attend.

	Not available	Definitely available
[Day/Time slot]		
[Day/Time slot]		

[Day/Time slot]		
[Day/Time slot]		
[Day/Time slot]		
[Day/Time slot]		
[Day/Time slot]		

Ineligibility Text

Generic message: Thank you for your interest in the Inside Out Study. Unfortunately, we are unable to include you in the study at this time. Please feel free to contact us at inside.out.study@gmail.com with any questions or concerns. You can also directly contact the primary investigator, Rebecca Wilson, at rewilson@hawaii.edu or [phone number]

If do not agree to informed consent: You indicated that you do not agree to participate in this study, thus we do not need any further information from you. However, please feel free to contact us at inside.out.study@gmail.com with any questions or concerns. You can also directly contact the primary investigator, Rebecca Wilson, at rewilson@hawaii.edu or [phone number]

If age < 18 Thank you for your interest in this study. You indicated that you are not yet 18 years old, which means that you are not eligible to participate. Participants in this study must be at least 18 years of age. Please contact us at inside.out.study@gmail.com with any questions or concerns.

If age > 30 Thank you for your interest in this study. You indicated that you are older than 30 years of age. Participation in this study is limited to those between 18-30 years of age. Please contact us at inside.out.study@gmail.com with any questions or concerns.

If gender =male Thank you for your interest in this study. You indicated that you are male, which means that you are not eligible to participate. Participants in this study must be female. Please contact us at inside.out.study@gmail.com with any questions or concerns.

If pregnant or trying to become pregnant Thank you for your interest in this study. You indicated that you are either pregnant or trying to become pregnant, which means that you are not eligible to participate. Participants in this study cannot be pregnant. Please contact us at inside.out.study@gmail.com with any questions or concerns.

If gave birth in the past 6 months Thank you for your interest in this study. You indicated that you gave birth within the past six months, which means that you are not eligible to participate. Participants in this study cannot have given birth in the past six months. Please contact us at inside.out.study@gmail.com with any questions or concerns.

All students who were ineligible also received the following information about campus resources:

Campus resources for students with eating/weight-related concerns.

If you are concerned about your eating or weight and would like some support, there are several resources available to UH students for free or very low cost.
Eating concerns: The UH Manoa Center for Cognitive Behavioral Therapy – Eating Disorders Program can discuss with you what you are experiencing and assist you in finding appropriate help according to your needs. Please call them at 956-7326 to set up an appointment.
General concerns: Alternatively, the Counseling and Student Development Center can assist you with a variety of mental health concerns. They are located in QLC 312, and you can walk-in any time between 8:30 AM and 4:30 PM Mon-Fri, or you can set up an appointment by calling 956-7927.
Nutrition concerns: There are also nutritional counseling services available at the UH Health Services Manoa, please call 956-6221 for more information or to set up an appointment.
You can also contact the lead researcher, Rebecca Wilson, at [phone number] or rewilson@hawaii.edu with any questions or concerns.

Baseline Questionnaire

Please answer the following questions as completely and as honestly as you can. Different people will have different responses, and there are no "correct" or "incorrect" answers. Some questions will have answers provided: please circle the answer that matches you. For other questions, please write your answer.

1. Please list all of the ethnic groups that you belong to (i.e., African-American, Filipino, Hawaiian, Native American, Caucasian, Hispanic, Chinese, Japanese, etc.):

2. Which of these do you most strongly identify with culturally?

3. Sexual Orientation: Heterosexual   Homosexual   Bisexual   Other

4. Education Level:

Some high school   High school diploma/GED   Some college

College degree (4yr)   Some graduate school   Advanced degree

5. Over the past six (6) months, what has happened to your weight?

Decreased (Lost Weight)   Stayed approximately the same   Increased (Gained Weight)

6. How do you feel about your current weight?

Very Unsatisfied   Unsatisfied   Somewhat Unsatisfied   Somewhat Satisfied

Satisfied   Very Satisfied

7. What is the weight that you think you would be most satisfied at? _____ *lbs* or _____ *kg*

8. How many times have you been on a diet with the intention to lose weight/slim down? _____

9. Are you on a diet now?   Yes   No

10. How many times in your lifetime have you lost at least twenty pounds and gained it back again?

Never   Once or twice   Three or four times   Five times or more

11. What is your highest lifetime weight (not due to pregnancy)? _____ *lbs* or _____ *kg*

On a typical day, I eat about …

     12. _____ servings of fruit. *A serving of fruit is 1 medium sized fruit (the size of a tennis ball), 1/2 cup of chopped fruit (the size of a light bulb) or 3/4 cup of fruit juice (the size of a small Styrofoam cup).*

13. _____ servings of vegetables. *A serving of vegetables is 1/2 cup of cooked or raw vegetables (the size of a scoop of ice cream), 3/4 cup of vegetable juice (the size of a small Styrofoam cup) or 1 cup of raw leafy vegetables (the size of a baseball).*

14. _____ servings of whole grains. *A serving of whole grains is 1 slice of whole wheat bread (the size of an audio cassette tape), 1/2 cup cooked cereal, brown rice, or whole wheat pasta (the size of a tennis ball)*

Weight Loss Behavior Scale (WLBS)

*In the **next year**, how likely are you to try to lose weight using any of the following methods? Circle a number from 1 (not at all likely) to 9 (extremely likely) in the box to the right of each statement.*

1 = Not at all likely	2	3	4	5	6	7	8	9 = Extremely likely

1. Increasing exercise
2. Skipping meals
3. Increasing fruit and vegetable intake
4. Eating less meat
5. Decreasing fat intake
6. Fasting (not eating at all for a period of 8 hours or more)
7. Reducing snacking
8. Diet pills
9. Reducing junk food
10. Vomiting
11. Reducing the calories/kilojoules you eat
12. Eating less high-carbohydrate food
13. Reducing the quantity of food you eat
14. Appetite suppressants
15. Changing the type of food you eat
16. Liquid diets
17. Eating low-calorie food
18. Drinking less alcohol
19. Increasing cigarettes smoked
20. Laxatives or enemas

21. *Jenny Craig* or other weight loss program in which food is supplied
22. Weight loss group in which food is not supplied (e.g., *Weight Watchers*)
23. Diuretics (pills that make you urinate more frequently)
24. Eating smaller portions
25. Eliminating junk food
26. Eliminating snacking
27. Other:

Intuitive Eating Scale (IES)

Please circle the number that matches the degree to which you agree with the following statements.

Rating Scale

Strongly disagree	Somewhat Disagree	Neutral	Agree Somewhat	Strongly Agree
1	2	3	4	5

1. Without really trying, I naturally select the right types and amounts of food to be healthy.
2. I generally count calories before deciding if something is OK to eat.
3. One of my main reasons for exercising is to manage my weight.
4. I seldom eat unless I notice that I am physically hungry.
5. I am hopeful that I will someday find a new diet that will actually work for me.
6. The health and strength of my body is more important to me than how much I weigh.
7. I often turn to food when I feel sad, anxious, lonely, or stressed out.
8. There are certain foods that I really like, but I try to avoid them so that I won't gain weight.
9. I am often frustrated with my body size and wish that I could control it better.
10. I consciously try to eat whatever kind of food I think will satisfy my hunger the best.
11. I am afraid to be around some foods because I don't want to be tempted to indulge myself.
12. I am happy with my body even if it isn't very good looking.
13. I normally eat slowly and pay attention to how physically satisfying my food is.
14. I am often either on a diet or seriously considering going on a diet.
15. I usually feel like a failure when I eat more than I should.
16. After eating, I often realize that I am fuller than I would like to be.
17. I often feel physically weak and hungry because I am dieting to control my weight.
18. I often put off buying clothes, participating in fun activities, or going on vacations

(hoping I can get thinner first).
19. When I feel especially good or happy, I like to celebrate by eating.
22. I often find myself looking for something to eat or making plans to eat—even when I am not really hungry.
23. I feel pressure from those around me to control my weight or watch what I eat.
24. I worry more about how fattening a food might be, rather than how nutritious it might be.
25. It's hard to resist eating something good if it is around me, even if I'm not very hungry.
26. On social occasions, I feel pressure to eat the way those around me are eating—even if I am not hungry.
27. I honestly don't care how much I weigh, as long as I'm physically fit, healthy, and can do the things I want.
29. I feel safest if I have a diet plan, or diet menu, to guide my eating.
30. I mostly exercise because of how good it makes me feel physically.

Body Shape Questionnaire Version 8C (BSQ-8C)

*We would like to know how you have been feeling about your appearance over **the past week.***

Never	Rarely	Some-times	Often	Very often	Always
1	2	3	4	5	6

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?

Eating Attitudes Test (EAT-26)

Please circle a response for each of the following statements

Never	Rarely	Some-times	Often	Usually	Always
1	2	3	4	5	6

1. Am terrified about being overweight.
2. Avoid eating when I am hungry.
3. Find myself preoccupied with food.
4. Have gone on eating binges where I feel that I may not be able to stop.
5. Cut my food into small pieces.
6. Aware of the calorie content of foods that I eat.
7. Particularly avoid food with a high carbohydrate content (i.e., bread, rice, potatoes, etc.)
8. Feel that others would prefer if I ate more.
9. Vomit after I have eaten.
10. Feel extremely guilty after eating.
11. Am preoccupied with a desire to be thinner.
12. Think about burning up calories when I exercise.
13. Other people think that I am too thin.
14. Am preoccupied with the thought of having fat on my body.
15. Take longer than others to eat my meals.
16. Avoid foods with sugar in them.
17. Eat diet foods.
18. Feel that food controls my life.
19. Display self-control around food.
20. Feel that others pressure me to eat.
21. Give too much time and thought to food.
22. Feel uncomfortable after eating sweets.

23. Engage in dieting behavior.
24. Like my stomach to be empty.
25. Have the impulse to vomit after meals.
26. Enjoy trying new rich foods.

PrimeScreen (PS)

*Please circle the answer that best describes your eating habits over the **past week**.*

Less than once per week	Once per week	2-4 times per week	Nearly daily or daily	Twice or more per day
1	2	3	4	5

How often do you eat…
1. Dark green leafy vegetables (spinach, romaine lettuce, mesclun mix, kale, turnip greens, bok choy, swiss chard):
2. Broccoli, broccoli rabe, cauliflower, cabbage, brussel sprouts
3. Carrots
4. Other vegetables (e.g., peas, corn, green beans, tomatoes, squash
5. Dried beans, split peas or lentils
6. Citrus fruits (e.g., oranges, grapefruits)
7. Other fruits (e.g., fresh apples or pears, bananas, berries, grapes, melons)
8. Whole milk dairy foods (whole milk, hard cheese, butter, ice cream)
9. Low-fat milk products (e.g., low-fat/skim milk, yogurt, cottage cheese)
10. Whole eggs
11. Beef, pork or lamb
12. Processed meats (sausages, salami, bologna, hot dogs, bacon)
13. Turkey or chicken
14.Fish/Seafood (not fried, but broiled, baked, poached or canned)
15. Stick margarine
16. Refined grains (white bread, white rice)
17. Whole grain breads and cereals (whole wheat, oatmeal, brown rice, barley)
18. Baked products (muffins, doughnuts, cookies, cake, pastries)
19. Calorie-containing beverages (i.e., Regular soda , Snapple, Nestea, Gatorade)
20. Deep fried foods
21. How often do you add salt to food at the table?

Anti-Fat Attitudes Questionnaire (AAQ)

Please respond to the following statements by indicating how well each statement describes your beliefs. Circle a number from 1 (very strongly disagree) to 9 (very strongly agree) in the box to the right of each statement.

1 = Very Strongly Disagree	2	3	4	5	6	7	8	9 = Very Strongly Agree

1. I really don't like fat people much.
2. I don't have many friends that are fat.
3. I tend to think that people who are overweight are a little untrustworthy.
4. Although some fat people are surely smart, in general, I think they tend not to be quite as bright as normal weight people.
5. I have a hard time taking fat people too seriously.
6. Fat people make me feel somewhat uncomfortable.
7. If I were an employer looking to hire, I might avoid hiring a fat person.
8. I feel disgusted with myself when I gain weight.
9. One of the worst things that could happen to me would be if I gained 25 pounds.
10. I worry about becoming fat.
11. People who weigh too much could lose at least some part of their weight through a little exercise.
12. Some people are fat because they have no willpower.
13. Fat people tend to be fat pretty much through their own fault.

Short Form 12 (SF-12)

1. In general, how would you rate your health?   Fair   Poor   Good   Very Good   Excellent

The following items are about activities you might do during a typical day. Does *your health* now *limit you* in these activities?

> 2. **Moderate activities** (such as moving a table, pushing a vacuum cleaner, bowling or playing golf)
> No, not limited at all   Yes, limited a little   Yes, limited a lot

> 3. Climbing **several** flights of stairs   No, not limited at all   Yes, limited a little   Yes, limited a lot

During the *past week*, have you had any of the following problems with your work or other regular daily activities *as a result of your physical health*?

> **4. Accomplished less** than you would like   Yes   No

> 5. Were limited in the **kind** of work or other activities   Yes   No

During the *past week,* have you had any of the following problems with your work or other regular daily activities *as a result of any emotional problems* (such as feeling depressed or anxious)?

> **6. Accomplished less** than you would like   Yes   No

> 7. Didn't do work or other activities as **carefully** as usual   Yes   No

8. During the **past week**, how much did **pain** interfere with your normal work (including both work outside the home and housework)?   Not at all   Slightly   Moderately   Quite a bit   A lot   Extremely

These questions are about how you feel and how things have been with you *during the past week*. For each question, please give the one answer that comes closest to the way you have been feeling.

How much during the **past week**...

9. ...have you felt calm and peaceful?

    None of the time   A little of the time   Some of the time   A good bit of the time   Most of the time   All of the time

10. ...did you have a lot of energy?

    None of the time   A little of the time   Some of the time   A good bit of the time   Most of the time   All of the time

11. ...have you felt downhearted and blue?

    None of the time   A little of the time   Some of the time   A good bit of the time   Most of the time   All of the time

12. During the **past week**, how much of the time has your **physical health or emotional problems** interfered with your social activities (like visiting with friends, relatives, etc)?

    None of the time   A little of the time   Some of the time   A good bit of the time   Most of the time   All of the time

Knowledge Questions

The following questions survey your knowledge about various topics related to eating and weight. Please answer the following questions to the best of your ability (without asking anyone or looking up the answers).

1. What would be in a meal that follows the MyPlate guidelines?

2. What percentage of women have the body type generally seen in advertising? (i.e., thin, tall, light-skinned)

    a) 5%

    b) 9%

    c) 17%

    d) 33%

3. Dieting is ineffective at producing long-term weight loss and satisfaction.

4. Most studies indicate that overweight people eat more than normal weight people

Feedback Questions

Please answer the following questions about the Inside Out Study. Circle the response that best describes how much you agree with each statement.

Rating Scale:

Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
1	2	3	4	5	6	7

1. I incorporated what I learned in the *Inside Out Study* into my life.
2. I think about the things I learned in the *Inside Out Study*.
3. I talk about the things I learned in the *Inside Out Study* with other people.
4. The *Inside Out Study* taught me new information
5. I enjoyed the *Inside Out Study*
6. What did you like about the *Inside Out Study*? (Open-ended)
7. What could be improved about the *Inside Out Study*? (Open-ended)

Please answer the following questions about healthy/balanced eating. Circle the response that best describes how much you agree with each statement.

8. The *Inside Out Study* made me **want** to eat more healthfully.
9. The *Inside Out Study* made me feel **more capable** of eating healthfully.
10. Due to my participation in the *Inside Out Study*, I eat more healthfully now.
11. What makes it difficult for you to eat healthfully? (Open-ended)
12. The Inside Out Study helped me to address these difficulties.

Please answer the following questions about the dieting mentality. Circle the response that best describes how much you agree with each statement.

13. The *Inside Out Study* made me **want** to reject the dieting mentality (i.e. not diet)
14. The *Inside Out Study* made me feel **more capable** of rejecting the dieting mentality.
15. Due to my participation in the *Inside Out Study*, I reject the dieting mentality and am less likely to diet now.
16. What makes it difficult for you to reject the dieting mentality? (Open-ended)
17. The *Inside Out Study* helped me to address these difficulties.

Please answer the following questions.

18. If you were **<u>less</u>** likely to diet after this program, what was the main reason? (Open-ended)

19. If you were **<u>not</u>** less likely to diet after this program, what was the main reason? (Open-ended)

20. If you were **<u>more</u>** likely to eat healthfully after this program, what was the main reason? (Open-ended)

21. If you were **<u>not</u>** more likely to eat healthfully after this program, what was the main reason? (Open-ended)

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