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An Experimental Study of Pro-Dieting and Anti-Dieting Psychoeducational Messages:
Effects on Immediate and Short-Term Psychological Functioning and Weight Control
Practices in College Women

by

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A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
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An Experimental Study of Pro-Dieting and Anti-Dieting Psychoeducational Messages:
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ABSTRACT

While dieting is relatively normative in our society, it is controversial within the fields of eating disorders and obesity. Dieting for weight loss has been touted by the obesity prevention field as a solution to the growing obesity epidemic, yet a body of research in the eating disorders field has also implicated it in the etiology and maintenance of eating pathology. Thus, a divergence in approaches toward dieting has emerged, with both pro-dieting and anti-dieting messages being recommended. Little is known, however, about the impact of these two types of messages on immediate and short-term psychological functioning and weight control intentions and behaviors. The current study sought to explore this gap in the extant literature by conducting an experimental study that evaluated the two messages. Undergraduate women (N=139) were randomly assigned to either a pro-dieting, anti-dieting, or no-dieting (control) message condition.

Psychological functioning and weight control variables were assessed at baseline, post-test, and a two-week follow-up. Results indicated that the pro-dieting message resulted in significantly greater post-test perceived pressure to lose weight, dieting intentions, and thin-ideal internalization intentions while the anti-dieting message yielded significantly lower post-test bulimic intentions. Healthy eating behavior significantly increased from

baseline to follow-up in the pro-dieting condition while there were no changes in the other two conditions. Post-test perceived pressure was found to fully mediate the relationship between diet message and post-test dieting, bulimic, thin-ideal internalization, and healthy eating intentions as well as follow-up healthy eating behavior. Trait thin-ideal internalization levels moderated the relationship between diet message and post-test perceived pressure and thin-ideal internalization intentions. Exploratory analyses revealed that overweight participants in the pro-dieting condition increased significantly from pre to post-test on state body dissatisfaction and had the highest level of post-test perceived pressure compared to all other groups. Non-overweight participants in the pro-dieting condition also had significantly greater post-test perceived pressure to lose weight than both weight status groups in the other two conditions. Findings are discussed in the context of the prevention goals of the obesity and eating disorders fields. Limitations of the study and directions for future research are offered.

Chapter 1

Introduction

Overview

Disturbances of eating and weight are a considerable problem in American society and can range from symptoms of extremely restrictive dieting, exercising, and bingeing and purging behaviors to excessive overeating and a complete lack of physical activity (Thompson, 2004a). At one extreme are the eating disorders of anorexia nervosa and bulimia nervosa. Anorexia nervosa is characterized by weight that is below 85% of what would be expected given height, an intense fear of fatness, a distorted body image, and amenorrhea (American Psychiatric Association, 2000). Bulimia nervosa is characterized by recurrent episodes of binge eating, compensatory behaviors such as purging, excessive exercise, or laxative use to prevent weight gain from binges, and a distorted body image (American Psychiatric Association, 2000).

Eating disorders are a particular problem for adolescent girls and young adult women (Streigel-Moore & Smolak, 2001; Thompson & Smolak, 2001). They are one of the most prevalent psychiatric disorders experienced by young females with a 0.5-1% prevalence rate for anorexia nervosa and a 1-3% prevalence rate for bulimia nervosa (American Psychiatric Association, 2000; Thompson, Roehrig, & Kinder, in press). An additional 10-13% of adolescent and college females engage in sub-clinical, disordered eating practices (Irving & Neumark-Sztainer, 2002). Eating disordered symptoms are

associated with a number of negative physical and psychological consequences, including a chronic course (Fairburn, Cooper, Doll, Norman, & O'Conner, 2000), psychiatric comorbidity (Fichter & Quadflieg, 1999; Sullivan, Bulik, Carter, & Joyce, 1996), high rates of mortality and morbidity (Reijonen, Pratt, Patel, & Greydanus, 2003), and self-injury (Favaro & Santonastaso, 1996).

At another extreme is obesity, which is characterized by excessive weight for age and height and defined as a body mass index (BMI) over 30 (Devlin, Yanovski, & Wilson, 2000; Flegal, Carroll, Kuczmarski, & Johnson, 1998; World Health Organization, 1998). BMI is standardized by age and height and is computed as weight (in kilograms) divided by height (in meters) squared (Field, Barnoya, & Colditz, 2002). Similarly, overweight is defined as a BMI between 25 and 29.9 (Devlin et al., 2000; Flegal et al., 1998; World Health Organization, 1998). Excess body fat leading to overweight and obesity results from an imbalance of caloric intake and physical expenditure with greater calories consumed than used. While most overweight or obese individuals do not suffer from a diagnosable eating disorder, a substantial minority of them do meet criteria for binge eating disorder with estimates ranging from 10-33% (Grilo, 2002; Grissett & Fitzgibbon, 1996; Yanovski, Nelson, Dubbet, & Spitzer, 1993). Binge eating disorder is characterized by the presence of out of control binge eating without subsequent compensatory behaviors such as exercise, purging, or fasting (American Psychiatric Association, 2000). Additionally, overweight and obese adults and adolescents are more likely to engage in sub-clinical levels of binge eating (Marcus, 1993) and unhealthy weight control practices (i.e., diet pills, laxatives, diuretics;

Neumark-Sztainer, Story, Faulkner, Beuhring, & Resnick, 1999) than those who are not overweight.

Rates of overweight and obesity are increasing at alarming rates, and public health officials have noted these increases are at epidemic proportions (Henderson & Brownell, 2004; World Health Organization, 1998). The rate of obesity has doubled in Americans since the 1980s, and currently one-third of American adults are obese (Flegal et al., 1998). Data from the 1999-2000 National Health and Nutrition Examination Survey (NHANES) conducted by the Centers for Disease Control indicate that 64% of Americans over twenty are overweight and that 33% of adult women and 28% of adult men are obese, with minority women experiencing even higher rates than Caucasian women (Flegal et al., 1998). Obesity is associated with a number of negative health consequences including heart disease, diabetes, stroke, hypertension, osteoarthritis, sleep apnea and certain types of cancer (Sarwer, Foster, & Wadden, 2004) as well as psychological difficulties, including body dissatisfaction, low self-esteem, and weight-related stigmatization (Neumark-Sztainer & Haines, 2004; Schwartz & Brownell, 2002).

While obesity and disordered eating have both significantly increased in prevalence over the last twenty years, researchers have historically regarded these problems as orthogonal (Brownell & Rodin, 1994; Irving & Neumark-Sztainer, 2002). Little overlap has occurred between the eating disorder and obesity fields, and distinct etiological theories and methods for the treatment and prevention of these difficulties have been implemented (Irving & Neumark-Sztainer, 2002; Smolak & Striegel-Moore, 2004). Theoretical as well as practical reasons have led some researchers to call for greater integration between the two fields, particularly in the domains of etiology and

prevention (Battle & Brownell, 1996; Irving & Neumark-Sztainer, 2002; Smolak & Striegel-Moore, 2004). Irving and Neumark-Sztainer (2002) note that there is substantial overlap in etiological factors related to eating disorders and obesity, and they suggest that disordered eating practices and obesity should not be viewed as conceptually distinct. At this point, however, the mechanisms involved are unclear, and future research must systematically investigate shared etiological factors and prevention strategies (Smolak & Striegel-Moore, 2004).

Accordingly, the current study seeks to bridge the fields of eating disorders and obesity by systematically examining the psychoeducational prevention messages espoused by each group. While both of these messages have the goal of increasing health-related behaviors and decreasing dysfunctional eating patterns, they take very different stances on dieting and weight loss (Irving & Neumark-Sztainer, 2002). In fact, the recommendations of these two messages appear to be in direct conflict with one another. The obesity prevention message espouses a pro-dieting approach to weight loss and maintenance while the eating disorder prevention message advocates an anti-dieting approach. The eating disorder prevention approach was developed based on the consistent finding that perceived pressure to be thin is a risk factor for the development of eating pathology. It promotes acceptance of all body sizes and shapes and seeks to reduce sociocultural pressures to be thin (Stice, 2002; Stice & Hoffman, 2004). Genetics are often discussed as a significant factor in body weight and shape, and participants are encouraged to avoid dieting and to eat and exercise in moderation (National Eating Disorder Association, 2004; Stice & Shaw, 2004). In contrast, the obesity prevention message stemmed from a medical model, which views dieting and weight loss as a

solution to the serious health consequences associated with overweight and obesity (Brownell & Rodin, 1994). It stresses restricting caloric intake and increasing physical activity to control and lose weight and tends to de-emphasize the role of genetics in overweight and obesity (Brownell & Rodin, 1994; Centers for Disease Control and Prevention, 2004; Irving & Neumark-Sztainer, 2002).

Previous research has found that exposure to psychoeducational messages focused on reducing perceived sociocultural pressures to be thin has produced decreases in established risk factors for eating disorders such as body dissatisfaction and thin-ideal internalization as well as eating pathology in some at-risk samples (e.g., Stice & Ragan, 2003; Stice & Shaw, 2004). However, no research was located that examined the effects of the pro-dieting, obesity prevention message on psychological functioning or eating and weight control intentions and behaviors. While prior research suggests that extensive obesity education programs targeting weight loss in self-selected individuals may lead to increases in healthy eating habits such as fruit and vegetable consumption and decreased fat intake over several months (Jason, Greiner, Naylor, Johnson, & Van Egeren, 1991; Jeffery & French, 1999; Miles, Rapoport, Wardle, Afuape, and Duman, 2001), no studies were found that examined the acute effects of either the obesity prevention message or the eating disorder prevention message on healthy eating and weight control intentions and behaviors. Given the recent explosion in media coverage on dieting and weight concerns, it appears timely to directly examine the psychological and behavioral effects of these messages. Therefore, the current study intends to experimentally manipulate the pro-dieting, obesity prevention and anti-dieting, eating disorder prevention messages and examine the immediate and short-term effects on psychological functioning (i.e.,

perceived pressure to be thin, body satisfaction, negative affect, drive for thinness) as well as intentions and behaviors related to healthy and unhealthy weight control practices (i.e., dieting, bulimic symptoms, healthy eating) in undergraduate women, who are targets of both of these psychoeducational messages.

The first section of this paper will introduce the concepts and nomenclature of risk factor research. Etiological theories and risk factor research on eating and weight disturbances will then be discussed with an emphasis on the role of the sociocultural environment. The next section will discuss the controversy surrounding dieting, specifically its relationship to eating pathology and impact on treatment and prevention recommendations. Lastly, results from a pilot study that examined immediate perceptions of diet-related psychoeducational messages will be discussed, and goals and hypotheses for the current study will then be offered.

Risk Factor Research

Discrepancies among the findings of experimental, prospective, and cross-sectional studies can occur and can have a significant impact on theories of etiology as well as recommendations for treatment and prevention. To address this problem, researchers have called for a standardized nomenclature of risk factor terminology and have outlined strategies for risk factor research. The following section will discuss the nomenclature of risk factor research as well as research methodologies that have been recommended to standardize risk factor research.

Kraemer, Kazdin, Offord, & Kessler (1997) argue that it is essential that risk factor terminology be standardized in order to promote methodologically sound research.

Rigorous risk factor research that uses a common language among investigators has several important implications. For example, it allows researchers to be able to differentiate between variables that are true risk factors and those that are not, which is important in the development and refinement of etiological models of a disorder and are also essential to inform the development of effective prevention and treatment programs (Weissberg, Kumpfer, & Seligman, 2003). Accordingly, Kraemer et al. (1997) define (1) *risk* as the probability of an outcome occurring, (2) a *correlate* as a factor associated with the outcome of interest, (3) a *risk factor* as a measurable characteristic that temporally precedes the outcome of interest, (4) a *variable risk factor* as a risk factor that can be changed, and (5) a *causal risk factor* as a variable risk factor that when manipulated produces changes in the outcome of interest. Kraemer et al. (1997) argue that to effectively measure risk, the outcome of interest must be defined clearly and all variables of interest must be measured using psychometrically sound instruments.

Research methodology is critical in distinguishing among these various types of risk, and Kraemer et al. (1997) have outlined the process for establishing risk-factor status, which includes sequential stages beginning with a *correlate* and ending with a *causal risk factor*. Different research designs are needed during each stage of the risk-factor research process, and each design has its own role in the process of establishing the risk factor status of a variable. The following section will describe each stage of the risk factor research process and illustrate the importance of each phase.

Cross-sectional designs should be utilized in the first stage of risk factor research to establish *correlate* status (Kraemer et al., 1997). Because temporal precedence is the critical characteristic of a risk factor, cross-sectional designs cannot be used to establish

risk factor status but are important as they establish a relationship between two variables in a relatively cheap and easy study. After correlate status is confirmed, the second phase of risk factor research involves determining whether a factor precedes the outcome of interest (Kraemer et al., 1997). A prospective design must be utilized during this phase to examine whether the correlate variable is present before the development of the outcome of interest, and only longitudinal designs can definitively establish temporal precedence (Kazdin, 2003). Because prospective studies are costly and time consuming, it is important that this design is not utilized until correlate status has been attained through cross-sectional design. If temporal precedence is established in the longitudinal study, then the variable can be deemed a risk factor for the outcome of interest. If temporal precedence is not established after having been studied prospectively, then Kraemer and colleagues (1997) suggest the terms *concomitant* or *consequence* be used to describe the relationship of the correlate variable to the outcome of interest.

According to Kraemer et al. (1997), an important distinction must be made in all empirically established risk factors. They propose that risk factors should be characterized as one of two types: *variable* or *fixed marker*. A variable risk factor is one that can be changed within an individual either spontaneously (i.e., age) or through intervention (i.e., administration of a drug). A fixed marker, on the other hand, is a risk factor that cannot change within an individual such as race or gender. This distinction is important for informing future risk factor research as well as for the development of prevention and treatment programs.

The last phase of the research process for establishing risk factor status involves using an experimental design to manipulate a variable risk factor. If the experimental

manipulation of the variable risk factor results in a change in the outcome of interest, then the variable should be called a *causal risk factor* rather than using the term the “cause” (Kraemer et al., 1997). This distinction is critical, as it allows for the likelihood of multiple pathways to an outcome of interest. Additionally, it is important to note that the identification of causal risk factors does not suggest knowledge of mechanisms by which causal risk factors exert their influence (Kraemer et al., 1997). Future research must be conducted to ascertain these processes.

If the experimental manipulation, however, does not result in a change in the outcome of interest, the term causal risk factor cannot be used. The variable may be considered a variable marker or may have in fact been a proxy risk factor. A *proxy risk factor* is defined as a variable that is strongly correlated with a true risk factor and thus appears to precede the outcome of interest; however, if a proxy risk factor is manipulated, it will not result in changes in the outcome of interest whereas manipulation of a causal risk factor will lead to subsequent reductions in the outcome of interest (Kraemer et al., 2001).

In sum, each type of research design has a role in the process of establishing risk factor status. While only experimental designs can determine whether a risk factor is a “causal” risk factor according to the criteria proposed by Kraemer et al. (1997), cross-sectional, case-control, and longitudinal designs must all be conducted earlier in the process of establishing risk factor status. As Kraemer et al. (1997) note, risk factors must be characterized into different types of risk factors (i.e., variable, fixed, causal) in order to inform the development of effective prevention and treatment programs. Kraemer and

colleagues (1997) have called for researchers to continue to search for causal risk factors to move towards a greater understanding of the etiology of a disorder.

Etiological Models of Eating and Weight Disturbances

Researchers postulate that eating and weight disturbances develop through a complex interaction among genetic, cultural, social, behavioral, and psychological mechanisms (Brownell & Wadden, 1992; Bulik, 2004; Cope, Fernandez, & Allison, 2004; Stein, O'Byrne, Suminski, & Haddock, 2000; Thompson et al., in press).

Behavioral genetic studies have verified the substantial role that genes play in the development of eating and weight disorders, and researchers are beginning to make advances in knowledge of the interactions that occur among these genes (Bulik, 2004; Cope et al., 2004). Yet despite this progress, geneticists caution that the expression of genes is highly dependent upon the environment (Cope et al., 2004). This fact coupled with the recent explosion of disturbed eating practices and obesity over the last twenty years has led many researchers to focus on the sociocultural environment, and its role in the etiology of eating and weight disturbances (Anderson-Fye & Becker, 2004; Battle & Brownell, 1996; Irving & Neumark-Sztainer, 2002; Stice, 2001; Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999).

Obesity has been conceptualized as a complex condition that has a heterogeneous etiology (Brownell & Wadden, 1992; Devlin et al., 2000). It arises when an individual has a positive energy balance, and therefore consumes more energy than is expended (Stein et al., 2000). While this simple equation inevitably results in weight gain, the factors that lead to this energy imbalance are multifaceted and complex. For example, a

combination of behavioral and biological variables including physical inactivity, excessive caloric intake, high fat diets, low resting metabolic rate, low rates of fat oxidation, insulin sensitivity, and high fat cell numbers can contribute to the development and maintenance of obesity (Brownell & Wadden, 1992; Stein et al., 2000; Tataranni & Ravussin, 2002).

Despite the mounting evidence that up to 70% of the variance in BMI can be accounted for by genetic variations, Tataranni and Ravussin (2002) acknowledge that research appears to support a paradigm shift for geneticists, suggesting that obesity is a condition that results from “normal physiological variability within a pathoenvironment” (p.61). In fact, proponents of an environmental explanation for the obesity epidemic have coined the term “toxic environment” to describe modern American society, which is characterized by the widespread availability and marketing of cheap, quick, and tasty energy dense foods that are high in fat and sugar and low in nutritional value, “supersize” portions, and an increasingly sedentary lifestyle coupled with a glorification of thinness and stigmatization of fatness (Battle & Brownell, 1996; Henderson & Brownell, 2004; Irving & Neumark-Sztainer, 2002; Wadden, Brownell, & Foster, 2002). As Battle and Brownell (1996) note, “it is difficult to envision an environment more effective than ours for producing nearly universal body dissatisfaction, preoccupation with eating and weight, and clinical cases of eating disorders and obesity (p. 761).”

In addition to the effect the environment has on obesity, researchers have also argued that the sociocultural environment plays a significant role in the etiology and maintenance of disturbed eating and weight control practices (Anderson-Fye & Becker, 2004; Heinberg, 1996; Thompson et al., 1999). Theorists have posited the mechanisms

by which sociocultural forces foster the development of disturbed eating practices such as excessive restricting, bingeing, and purging. Two competing, yet similar, models of eating disorder symptomatology in females have been proposed, the Tripartite Model (Thompson et al., 1999; van den Berg, Thompson, Obremski-Brandon, & Coover, 2002; See Appendix A) and the Dual-Pathway model (Stice, Nemeroff, & Shaw, 1996; Stice, 2001; See Appendix B). Both models hypothesize that sociocultural pressures to be thin and internalization of the thin-ideal, which is the extent to which one “buys into” societal standards of appearance and weight both cognitively and behaviorally (Thompson & Stice, 2001, p.181), contribute to eating disturbances by fostering the development of body dissatisfaction. Body dissatisfaction, in turn, is hypothesized to foster dieting, eating disordered symptoms, and negative affect as the ideal is almost impossible to attain for the average female (Heinberg, 1996; Stice, 2001; Thompson et al., 1999).

Cross-sectional, structural equation modeling studies on undergraduate females have found broad support for both the Tripartite Model (van den Berg et al., 2002) and the Dual-Pathway Model (Stice et al., 1996). Stice (2001) also found support for the Dual-Pathway Model in a twenty-month prospective study of adolescent girls using random regression growth curve models. Specifically, Stice (2001) found evidence that initial levels of perceived pressure to be thin and thin-ideal internalization predicted increases in body dissatisfaction over time. Thin-ideal internalization and pressure to be thin were also found to prospectively predict growth in dieting even in the absence of body dissatisfaction, leading Stice (2001) to conclude that sociocultural pressure to be thin as well as thin-ideal internalization appear to have direct and indirect influences on promoting dieting. Additionally, results supported the hypothesis that initial levels of

body dissatisfaction predicted subsequent growth in dieting and negative affect. Initial levels of negative affect and dieting also prospectively predicted growth in bulimic symptoms, and the relationship between body dissatisfaction and bulimic symptoms was completely mediated by dieting and negative affect. Initial level of dieting, however, only led to a marginally significant growth in negative affect. Collectively, findings from structural equation modeling studies support the theoretical assertions that sociocultural pressure to be thin, thin-ideal internalization, body dissatisfaction, dieting, and negative affect promote the onset of bulimic symptomatology.

Causal Risk Factors for Eating Pathology

Stice (2002) conducted a meta-analysis on risk and maintenance factors for eating pathology. In order to ensure that only true risk factors were included in the meta-analysis, Stice limited the studies reviewed to longitudinal and experimental studies. It is important to note that all of the studies found in his literature review examined bulimic symptoms, binge eating, or eating disorder composites; none of them focused solely on anorexic symptoms. Therefore, Stice's (2002) findings may only be generalizable to bulimic or binge eating symptoms.

Several possible risk factors were examined in Stice's (2002) meta-analysis, including body mass, perceived sociocultural pressure to be thin, modeling of body image or eating disturbances by parents and/or peers, thin-ideal internalization, body dissatisfaction, dieting, negative affect, perfectionism, early menarche, and impulsivity. This meta-analysis supported the conclusion that several of these variables met Kraemer et al.'s (1997) criteria as established risk factors for eating pathology. Specifically, Stice

(2002) found that perceived sociocultural pressure to be thin, thin-ideal internalization, body dissatisfaction, negative affect, and perfectionism are all risk factors for eating pathology; however, he concluded that only perceived sociocultural pressure to be thin and thin-ideal internalization meet Kraemer et al.'s (1997) criteria for causal risk factors for eating pathology.

Stice's (2002) finding that thin-ideal internalization meets criteria for a causal risk factor corroborates the conclusions of Thompson and Stice (2001). Thompson and Stice (2001) outline the phases of research on thin-ideal internalization and report that early cross-sectional research established it as a correlate of eating disturbances. They then reviewed the longitudinal research on thin-ideal internalization and concluded that it prospectively predicts eating pathology, which establishes it as a risk factor based on Kraemer et al.'s (1997) criteria. Lastly, Thompson and Stice (2001) reviewed experimental prevention studies that manipulated thin-ideal internalization over the course of three hour-long sessions (Stice, Mazotti, Weibel, & Agras, 2000; Stice, Chase, Stormer, and Appel, 2001; Stice, Trost, and Chase, 2003). Because these experimental manipulations of thin-ideal internalization have led to decreases in body dissatisfaction and eating pathology, thin-ideal internalization meets Kraemer et al.'s (1997) criteria for a causal risk factor.

Stice's (2002) conclusion that perceived sociocultural pressure to be thin meets criteria for a causal risk factor for eating pathology, however, appears to be somewhat premature. While there is ample evidence to support the conclusion that sociocultural pressure to be thin prospectively predicts body dissatisfaction and eating disturbances (e.g., Cattarin & Thompson, 1994; Stice, 2001; Stice & Agras, 1998), experimental

research on sociocultural pressure to be thin is limited. In fact, Stice's (2002) conclusion that it is a causal risk factor for eating pathology is based primarily on experimental studies of brief exposure to thin-ideal media images, which assessed body dissatisfaction and negative affect pre- and post- exposure to the images (see Groesz, Levine, & Murnen, 2002 for a meta-analytic review). While brief exposure to thin-ideal media likely exerts some degree of sociocultural pressure to be thin, none of these studies directly assessed the extent to which participants perceived pressure from the images, limiting the conclusions that can be drawn from these studies about the pressure construct. Additionally, thin-ideal media images do not appear to exert direct pressure to lose weight and/or maintain a thin body but rather portray an indirect, ubiquitous message that thin is beautiful and a necessary component for a happy, exciting, and fulfilling life.

Only one experimental study was located that directly manipulated sociocultural pressure to be thin. Stice, Maxfield, and Wells (2003) examined the effects of "fat talk" on undergraduate women's body satisfaction and negative affect. Participants in this study engaged in a 3-5 minute scripted conversation with one of the two study confederates, who were young adult women that both objectively met societal standards of thinness and attractiveness and had worked in the fashion industry. Participants were randomly assigned either to a condition in which the confederate discussed her dissatisfaction with her weight and the extreme exercise and diet strategies she used or to a neutral conversation condition in which the confederate discussed classes she was currently taking and her plans for the weekend. Body dissatisfaction was found to significantly increase from pre- to post-test in the experimental condition; however, no significant differences in negative affect were found between conditions. Measures of

dieting and bulimic symptoms were not obtained, so although the findings suggest that increased sociocultural pressure to be thin results in increased body dissatisfaction, which is a strong predictor of eating pathology (Thompson et al., 1999), it is unclear how social pressure from “fat talk” affects eating behaviors.

As Stice et al. (2003) is the first study to experimentally manipulate social pressure to be thin, much more research is needed to elucidate the role of pressure to lose weight and/or maintain a thin body in eating pathology and the associated risk factors of body dissatisfaction, thin-ideal internalization, negative affect, and dieting. In addition to more research on “fat talk” and other forms of pressure from peers, further experimental research on sociocultural pressure to be thin from other influential sources, including the media, parents, significant others, and health professionals, is warranted.

The Controversy Surrounding Dieting

In a seminal paper, Polivy and Herman (1985) outlined the tenets of Restraint Theory and proposed that dieting causes binge eating. Restraint Theory postulates that restrained eaters, a term Polivy and Herman (1985) used interchangeably with dieters (Lowe, 1993), rely heavily on cognitive factors rather than physiological cues to maintain control over their eating behavior. Laboratory research has consistently shown that restrained eaters can maintain their strict dietary guidelines and avoid overeating when demands of the study are low and allow them to follow their diet; however, when restrained eaters must consume a high-calorie pre-load (i.e., a milkshake) prior to a laboratory “taste test,” they overeat or even binge. Polivy and Herman (1985) call this phenomenon *counter-regulation* and assert that these episodes of overeating appear to be

due to a violation of the strict dietary rules of the restrained eater---the abstinence violation effect (Marlatt & Gordon, 1985). Counter-regulation has also been found to occur in laboratory-induced negative affect and alcohol consumption (Lowe, 1993; Polivy & Herman, 1985). Non-restrained eaters, on the other hand, show a more normal eating pattern under laboratory conditions. They eat more in the “taste test” if there is no high-calorie pre-load but less when there is one. Similarly, non-restrained eaters have been shown to eat less in distressful situations and following alcohol consumption than restrained eaters (Polivy & Herman, 1985).

Following from Restraint Theory, the cognitive-behavioral model of bulimia nervosa proposed that strict dieting is a key etiological factor in the development and maintenance of bulimic pathology (Fairburn, Marcus, & Wilson, 1993). According to Fairburn et al. (1993), extreme dieting behaviors often develop in individuals with low self-esteem who overvalue weight and shape in an attempt to enhance their self-worth. This severe dieting eventually leads to a violation of the strict dietary guidelines and results in a binge episode. Extreme weight control methods such as vomiting or laxative use may then be used to compensate for the excess calories consumed during the binge. This binge-purge cycle can become self-perpetuating and spiral out of control into a full-blown eating disorder (Fairburn et al, 1993).

Based on these models, theorists have generally agreed that dieting is a key etiological factor in eating pathology (Hsu, 1996). Empirical studies have provided some support for restraint theory and the cognitive-behavioral model of bulimia. Several retrospective studies of eating disordered patients have shown that dieting frequently precedes binge eating and the subsequent development of the eating disorder (Brewerton,

Dansky, Kilpatrick, & O'Neil, 2000; Bulik, Sullivan, Carter, & Joyce, 1997; Mitchell, Hatsukami, Eckert, & Pyle, 1985); however, retrospective studies also suggests that binge eating precedes significant dieting behaviors in a substantial minority of individuals (Brewerton et al., 2000; Bulik et al., 1997; Mussell, Mitchell, Weller, & Raymond, 1995) Several longitudinal studies using self-reported dietary restraint measures have found that dieting prospectively predicts bulimic symptomatology (Killen et al., 1994, 1996; Stice, 2001; Stice & Agras, 1998). A recent study, however, did not find dietary restraint to prospectively predict growth in bulimic symptomatology when simultaneously compared in a logistic regression equation with body dissatisfaction (Johnson & Wardle, 2005). Body dissatisfaction did remain a significant prospective predictor of bulimic symptoms when dieting was controlled.

Results from experimental studies of behavioral weight loss programs have also conflicted with the assertion that dieting is a key etiological factor in the development of bulimic symptoms. Studies of overweight and obese individuals placed on low-calorie diets in controlled trials have not shown subsequent increases in binge eating (Porzelius, Houston, Smith, Arfkin, & Fisher, 1995; Wadden, Foster, & Letizia, 1994). Furthermore, studies on obese individuals with binge eating disorder found significant decreases in binging over the course of university-based, behavioral weight loss treatments (Marcus, Wing, & Fairburn, 1995; Porzelius et al., 1995). Presnell and Stice (2003) replicated these findings in a non-obese sample of young adult women who were randomly assigned to a six-week, low calorie, behavioral weight loss treatment or a waitlist control group.

Stice, Presnell, Groesz, and Shaw (2005) examined the effects of a three-session weight management diet as opposed to a weight loss diet on bulimic pathology in

adolescent girls with elevated body image concerns. The intervention did not encourage calorie counting or a reduction in caloric intake as traditional behavioral weight loss programs do. Rather, the importance of a healthy body weight and balanced diet was stressed, and strategies for making these changes were discussed. Results confirmed that weight was indeed maintained in the intervention group over a one-year period while the measurement-only control group gained weight. Consistent with Stice et al.'s (2005) hypothesis, significant decreases in bulimic symptomatology were observed at the one-year follow-up in the intervention condition relative to the measurement-only control group.

Collectively, findings from randomized controlled trials of behavioral weight loss and weight maintenance treatments provide evidence that contradicts the primary tenet of Restraint Theory (Polivy & Herman, 1985)—that dieting promotes the onset of bulimic symptomatology. Not only was there no growth in bulimic pathology, but it was actually reduced over the course of these diet trials. Because of these findings from experimental research, Stice (2002) concluded in his meta-analysis that “dieting is not a risk factor for eating pathology but rather attenuates overeating tendencies” (p.836).

The literature on dieting is complicated by measurement issues, which may contribute to these conflicting findings. Dieting and restrained eating are often used interchangeably; however, research suggests that these are distinct constructs (Lowe, 1993). Dieting has been defined as purposeful restriction of caloric intake that results in a negative energy balance with the intention of weight loss or weight maintenance (Stice et al., 2005; Wadden et al., 2002). Much of the research that has been conducted on dieting has used one of three measures of restrained eating: the Restraint Scale (Polivy,

Herman, & Warsh, 1978), Three-Factor Eating Questionnaire-Cognitive Restraint Scale (Stunkard & Messick, 1985), and the Dutch Eating Behavior Questionnaire-Restrained Eating Scale (Van Strien, Frijters, Bergers, & Defares, 1986). Yet, these scales have not been found to assess actual dieting behavior as defined by a negative energy balance (Lowe, 1993; Stice, Fisher, & Lowe, 2004; Stice, Presnell, Lowe, & Burton, 2006). The restraint scales do appear, however, to measure an important albeit unclear construct in the development of bulimic pathology as they have consistently predicted growth in bulimic symptoms (Stice et al., 2006). More research is needed to elucidate the construct being assessed by the restraint scales as well as to develop a valid measure of dieting that reliably assesses a negative energy state.

In addition to measurement issues, the mixed findings in the literature could have occurred because there are different types of dieting with some types increasing and other types decreasing the risk for bulimic symptoms (Stice et al., 2006). Real-world dieting likely differs substantially from dieting in randomized, controlled behavioral weight loss and weight maintenance trials. As Stice et al. (2005) note, “dieting as usual” often involves meal skipping whereas behavioral weight loss and weight maintenance diets promote eating at regular intervals. Real-world dieting may also not follow proper nutrition and possibly exclude certain classes of food (i.e., carbohydrates) and may involve more intense caloric restriction than university-based diet programs. The relationship between self-initiated, real-world dieting and eating pathology remains unclear, and much more experimental research is needed to address this issue.

Dieting Recommendations: To Diet or Not to Diet

The controversy surrounding dieting has implications for the treatment and prevention of eating disorders and obesity. As mentioned previously, the obesity field stems from a medical model and has generally promoted dieting and stressed weight loss for most Americans with a particular emphasis on the health risks of excess weight (Brownell & Rodin, 1994; Irving & Neumark-Sztainer, 2002). Treatment and prevention efforts have primarily recommended caloric restriction and increased physical activity for the purposes of weight loss or weight maintenance (National Task Force on the Prevention and Treatment of Obesity, 2000). A large body of literature on randomized clinical trials of behavioral weight loss programs have consistently shown modest success (i.e., 8.5-9.0 kg loss on average) over the course of a 20-week program; however, maintenance of these gains after the termination of treatment is poor with patients regaining about one-third of their weight in the year post-treatment and almost all of it within five-years (Bacon et al., 2002; Wadden et al., 2002). Prevention efforts, particularly those geared towards adults, have also largely focused on weight as the outcome variable of interest with dietary and exercise changes promoted as a means of weight loss or weight maintenance and disease prevention (Cogan, 1999; Jeffery & French, 1999). Large-scale obesity prevention trials in adults have generally produced disappointing results (Schmitz & Jeffery, 2002).

Concerns about the long-term failure of most diets, the potential negative health consequences of weight cycling, and the role of dieting in the promotion and maintenance of eating pathology has lead several researchers to promote an anti-dieting or un-dieting approach (Foster & McGuckin, 2002; Polivy & Herman, 1992). The eating disorder field

has largely endorsed an anti-dieting approach in both treatment and prevention contexts (Fairburn et al., 1993; Irving & Neumark-Stzainer, 2002), and preventative interventions were designed using the etiological models of eating pathology which aim to reduce sociocultural pressures to be thin, lessen the importance of weight and shape, and teach participants to be critical consumers of the media (Stice & Shaw, 2004). Anti-dieting approaches have also emphasized: (1) the cessation of dieting, (2) learning to attend to physiological cues of hunger and satiety, (3) promoting body satisfaction and acceptance of current weight, and (4) enhancing self-esteem (Bacon et al., 2002; Polivy & Herman, 1992; Wadden et al., 2002).

Randomized controlled trials of undieting have largely found improvements in self-esteem, mood, and body image with little to no changes in body weight over the course of the intervention and follow-up (Foster & McGuckin, 2002). Some studies have also found positive changes in physiological indicators of health (i.e., blood pressure, lipids, cholesterol) in the absence of weight loss (Bacon et al., 2002; Mellin, Croughan-Minihane, & Dickey, 1997; Rapoport, Clark, & Wardle, 2000). A meta-analysis of the effectiveness of the anti-dieting approach in eating disorder prevention programs concluded that effective eating disorder prevention programs have been developed that have significantly reduced eating pathology and the associated risk factors of body dissatisfaction, thin-ideal internalization, and perceived pressure to be thin (Stice & Shaw, 2004). Interactive, psychoeducational interventions appear to be more effective than didactic formats at reducing eating pathology. The didactic anti-dieting psychoeducational programs tended to produce changes in knowledge about eating disorders with few changes in eating disorder risk factors (i.e., body dissatisfaction) and

no changes in eating pathology (Stice & Shaw, 2004). Successful interventions were generally multi-faceted and contained not only psychoeducation but some combination of group discussions, coping skills, media literacy, or peer pressure resistance skills components.

With so many different components utilized in these eating disorder prevention interventions, it is unclear which anti-dieting components were relatively successful and which ones were not. Paxton, Wertheim, Pilawski, Durkin, and Holt (2002) addressed this issue by systematically examining seven distinct anti-dieting messages frequently used in prevention programs and assessing their persuasiveness and immediate impact on psychological functioning and dieting intentions in adolescent girls. The messages were presented in brief video format. Results suggest that the messages were rated as a least somewhat relevant and important by most participants. Intentions to diet were significantly reduced in approximately a quarter to a third of the girls while the majority of participants reported no change in their intentions to diet. Furthermore, no changes in body satisfaction were observed from pre- to post-test. The Paxton et al. (2002) study appears to be the first to systematically examine the immediate perception and impact of the anti-dieting approach by assessing seven distinct anti-dieting messages; however, this study did not address the collective impact of these anti-dieting messages on persuasiveness, psychological functioning, and weight control intentions. Furthermore, its generalizability to adults is unknown. No research was located that examined how the pro-dieting message is perceived as well as its impact on immediate psychological functioning and weight control intentions.

To sufficiently address the question of whether health care professionals should recommend “to diet or not to diet,” more research should be conducted that directly compares these two approaches. A handful of randomized, controlled trials have directly compared these two approaches within the context of long-term outcome on weight, psychological functioning, and physiological measures (Bacon et al., 2002; Foster & McGuckin, 2002; Lowe et al., 2001); however, most people do not seek professional advice or treatment for dieting and weight loss and instead try it on their own (Serdula, Collins, Williamson, Pamuk, & Byers, 1993). They are most likely exposed to information on dieting and weight loss in everyday situations such as in the newspaper, on television, or from a health care provider. Therefore, it also appears necessary to examine the impact that exposure to these messages may have in a format that is more externally valid such as a brief written article or video. Because the pro-dieting and anti-dieting approaches diverge substantively on their recommendations towards dieting and weight control, it seems likely that they would be perceived differently and potentially yield significant differences in immediate psychological functioning (i.e., mood, body dissatisfaction) and weight control intentions. The following section will describe a pilot study that systematically examined the effects of the two dieting messages on perceived pressure to lose weight, body dissatisfaction, and dieting intentions.

Pilot Study

A pilot study was conducted to test the hypothesis that the pro-dieting and anti-dieting psychoeducational messages differ substantially in the amount of pressure perceived by participants to lose weight and/or maintain a thin body, body dissatisfaction,

and dieting intentions. The experimental stimuli for the pilot study were developed by compiling available information on obesity prevention, eating disorder prevention, as well as a neutral, flu prevention message from reputable online resources. Specifically, the websites for the U.S. Department of Health and Human Services, the Centers for Disease Control, and the National Eating Disorders Association were consulted, and the experimental stimuli were derived primarily using material from these agencies. These sources were consulted in an effort to not only provide accurate information but also to increase the external validity of the study by approximating as closely as possible the health information being disseminated to the public.

In an effort to obtain a strong experimental manipulation, material that appeared to clearly advocate weight loss and dieting versus non-weight loss and non-dieting was selected to be included in the obesity prevention and eating disorder prevention stimuli. Each of the experimental stimuli was presented on one-page in the format of a health information article and divided into the following subsections: prevalence and costs, definition, causes, consequences, and what the individual can do to prevent the problem. In addition, the headlines of each article emphasized the central point of the particular health education message and were equated on wording. For example, the pro-dieting, obesity prevention message stimuli stated, “Lose Weight and/or Maintain a Low Body Weight to Prevent Overweight and Obesity,” while the anti-dieting, eating disorder prevention message headline indicated, “Stop Dieting to Prevent Disordered Eating.” The flu prevention message also had a similarly structured headline that stated, “Get Vaccinated to Prevent the Flu.” Please see Appendices C, D, and E to review each of the health education messages in its entirety.

After the experimental stimuli were created, they were presented to an expert panel of researchers that specialize in the study of body image and eating disturbances to verify the content and readability of the messages. The expert panel consisted of one licensed clinical psychologist, six doctoral students in clinical psychology, and three undergraduate research assistants. Feedback from the expert panel suggested that the stimuli were sufficiently equated. Minor changes in wording were made based on feedback from the expert panel to ensure readability of each message.

Sixty-five undergraduate women between the ages of 18 and 47 ($M = 23.95$, $SD = 5.8$) were then randomly assigned to read one of the three psychoeducational dieting-related messages: (1) pro-dieting, obesity prevention, (2) anti-dieting, eating disorder prevention, and (3) no-dieting, flu prevention. The sample was ethnically diverse and composed of 47.7% Caucasian, 21.5% Hispanic, 18.5% African-American, 6.2% Asian/Pacific Islander, and 6.2% who identified themselves as Other. Self-reported weight and height indicates that 12.3% were underweight, 48.4% were average weight, 25% were overweight, and 14.3% were obese. Participants were compensated with one extra credit point in their psychology course.

In addition to demographic information, weight/shape dissatisfaction and affect were assessed pre-post test with the Visual Analogue Scale (VAS; Heinberg & Thompson, 1995; see Appendix F) and the Positive and Negative Affect Scale-Revised (PANAS-X; Watson & Clark, 1992; see Appendix G). After the pre-test measures were obtained, the participants were asked to read the psychoeducational material and answer several questions about their perceptions of it utilizing five true/false attention check items, a modified version of the Sociocultural Attitudes Towards Appearance

Questionnaire (SATAQ)-3 (Thompson, van den Berg, Roehrig, Guarda, & Heinberg, 2004; see Appendix H) Pressures and Internalization subscales, and the Message Rating Form (Sperry, Thompson, Roehrig, & Vandello, 2004; see Appendix I). Post-test VAS and PANAS-X measures were then completed, and the participants were debriefed and awarded their extra credit point.

Analyses were conducted to assess for any preliminary differences among the groups on the demographic and pre-test variables. No significant differences were found among the groups on race, $\chi^2(8) = 6.81, p > .05$, BMI, $F(2, 62) = .84, p > .05$, age, $F(2, 62) = .51, p > .05$, pre-test dissatisfaction with weight, $F(2, 61) = 1.0, p > .05$, pre-test dissatisfaction with shape, $F(2, 61) = 2.2, p > .05$, or pre-test PANAS-X scores, $F(2, 62) = .01, p > .05$. Collectively, these preliminary analyses suggest that random assignment was successful.

No participants met the a priori exclusion criteria for the attention check (< 4 of 5 correct; see Appendix Q), suggesting that all participants sufficiently attended to the experimental stimuli. Therefore, all participant data is included in the subsequent analyses. To examine for any differences among the three messages on non-specific factors, the Message Rating Form was examined with each item analyzed separately. A significant difference was found among the three groups in the extent to which the participants rated the messages as easy to understand, $F(2, 62) = 4.75, p < .05$, with Fisher's LSD post-hoc test suggesting that the no-dieting, flu prevention message was significantly more easy to understand ($M = 4.87$) than the pro-dieting, obesity prevention message ($M = 4.38$) and the anti-dieting, eating disorder prevention message ($M = 4.55$). No other significant differences were found on the Message Rating Form items (see

Table 1 for mean scores from pilot study), indicating that the messages were perceived as equally convincing, effective, applicable, and credible. Although the flu prevention condition was endorsed as easier to understand than the other two conditions, this does not appear to be a significant problem as examination of mean scores suggests that all three messages were highly understandable to the participants (all means over 4.37). Overall, results from the Message Rating Form indicate that the three messages were successfully equated on non-specific factors.

Table 1

Mean Scores for Pilot Study by Condition

Measure	Pro-Dieting, Obesity Prevention (N=21)	Anti-Dieting, Eating Disorder Prevention (N=22)	No-Dieting, Neutral Flu Prevention (N=22)
Pre-VAS BD	57.2 (31.13)	45.18 (37.99)	58.00 (30.81) ₁
Post-VAS BD	62.65 (34.59)	42.77 (37.44)	48.55 (32.32) ₂
Pre-VAS Shape Dissatisfaction	64.9 (27.69)	45.68 (35.77)	51.27 (25.54)
Post-VAS Shape Dissatisfaction	62.38 (32.99)	41.0 (37.9)	45.41 (28.52)
MRF-Convincing	4.14 (.73)	4.05 (.79)	4.18 (.85)
MRF-Effective	3.9 (.94)	3.45 (.86)	4.0 (.82)
MRF-Applicable	3.10 (1.5)	2.77 (1.38)	3.45 (1.38)
MRF-Easy to Understand	4.38 (.59) _a	4.55 (.6) _a	4.86 (.35) _b
MRF-Credible	3.86 (.57)	3.68 (.84)	3.95 (.84)
MRF-Influential	3.48 (1.12)	3.0 (.87)	3.5 (1.01)
Pre-PANAS-X	32.29 (11.87)	31.82 (11.3)	32.0 (14.58)
Post-PANAS-X	31.70 (10.33)	31.09 (13.48)	29.59 (12.86)
SATAQ-3 Perceived Pressure	16.43 (4.20) _a	9.45 (2.5) _b	9.32 (.89) _b
SATAQ-3 Internalization	21.48 (5.34) _a	13.05 (2.61) _b	13.82 (2.11) _b
Weight Loss Intention	3.05 (1.53) _a	1.59 (.91) _b	1.05 (.21) _b
Exercise Intention	4.38 (.92) _a	3.18 (1.37) _b	2.0 (1.16) _c

Note: Letter subscripts indicate significant differences across conditions; Number subscripts denote significant differences across time; VAS BD: Visual Analogue Scale-Body Dissatisfaction; MRF: Message Rating Form; PANAS-X: Positive and Negative Affect Scale-Revised; SATAQ-3: Sociocultural Attitudes Towards Appearance Scale-3

The modified SATAQ-3 Pressures subscale was then analyzed for differences among the three conditions on the pressures construct utilizing a one-way ANOVA. As hypothesized, a significant main effect was found for condition, $F(2, 62) = 43.60$, $p < .001$, partial $\eta^2 = .58$. Fisher's LSD post-hoc test indicates that participants in the pro-dieting, obesity prevention message felt significantly more pressure to lose weight ($M = 16.43$) than those in the anti-dieting, eating disorder prevention message ($M = 9.45$) and no-dieting, flu prevention message ($M = 9.32$). Differences between the eating disorder and flu prevention messages were not statistically significant. This finding remained significant even after an ANCOVA was run to control for BMI, $F(2, 61) = 48.1$, $p < .001$, partial $\eta^2 = .61$.

Group differences among behavioral intentions were then examined. A one-way ANOVA was computed on the modified SATAQ-3 Internalization subscale. A significant main effect for condition was found, $F(2, 62) = 35.57$, $p < .001$, partial $\eta^2 = .53$, with post-hoc tests revealing that the pro-dieting, obesity prevention message elicited significantly greater Internalization intentions ($M = 21.48$) than both the anti-dieting, eating disorder prevention message ($M = 13.05$) and the no-dieting, flu prevention message did ($M = 13.82$). The difference in mean scores between the eating disorder and flu prevention messages was non-significant. An ANCOVA revealed that this finding remained significant after controlling BMI, $F(2, 62) = 35.22$, $p < .001$, partial $\eta^2 = .54$.

Individual items assessing the extent to which the article made the participant want to start a weight loss diet and increase their physical activity were also analyzed in separate one-way ANOVAs. Significant main effects were found for both the weight loss and physical activity intentions, $F(2, 62) = 21.76$, $p < .001$, partial $\eta^2 = .41$, and $F(2, 62)$

= 22.42, $p < .001$, partial $\eta^2 = .42$, respectively. Fisher's LSD post-hoc tests revealed that the pro-dieting, obesity prevention message elicited a greater desire to start a weight loss diet ($M = 3.05$) than both the anti-dieting, eating disorder ($M = 1.59$) and no-dieting, flu ($M = 1.05$) prevention messages. The difference between the eating disorder and flu prevention messages was non-significant. An ANCOVA confirmed this finding was independent of BMI, $F(2, 61) = 29.44$, $p < .001$, partial $\eta^2 = .49$. Post-hoc tests also found significant differences in intentions to increase physical activity among all three conditions with the pro-dieting, obesity prevention message being greatest ($M = 4.38$), followed by the anti-dieting, eating disorder ($M = 3.18$) and no-dieting, flu ($M = 2.0$) prevention messages, which was independent of BMI, $F(2, 61) = 21.91$, $p < .001$, partial $\eta^2 = .42$.

Pre-post test analyses were then conducted to assess for state changes in weight and shape dissatisfaction and negative affect. Separate 3 (Condition) X 2 (Time) Mixed Design ANOVAs were computed. A significant time by condition interaction was found for weight/size dissatisfaction, $F(2, 61) = 6.21$, $p < .01$, partial $\eta^2 = .17$. Follow-up paired t-tests utilizing Bonferroni's correction indicate that the no-dieting, flu prevention group reported significant reductions in weight/size dissatisfaction from pre ($M = 58.0$) to post ($M = 48.6$) test; although non-significant, mean trends suggest that the pro-dieting, obesity prevention message elicited some increase in weight/size dissatisfaction from pre to post test ($M_1 = 57.2$, $M_2 = 62.7$). No significant changes were found pre-post on the shape dissatisfaction VAS or the PANAS-X total subscale score for any condition.

Overall, findings from the pilot study supported the hypothesis that the pro-dieting, anti-dieting, and no-dieting messages differ significantly in the extent to which

participants perceived pressure to lose weight and/or maintain a thin body from them. Significant differences in behavioral intentions also emerged with the pro-dieting, obesity prevention message eliciting greater internalization, dieting, and exercise intentions than the other two conditions. Exploratory analyses revealed a non-significant trend across time that the pro-dieting, obesity prevention message tended to produce increased body dissatisfaction at post-test.

Current Study

Based upon the results of the pilot study, experimental manipulation of the three prevention messages provides the opportunity to directly examine the effects of differing dieting messages (i.e., pro-dieting, anti-dieting, no dieting) on psychological functioning as well as weight control intentions and behaviors in undergraduate women. The current study builds upon the pilot study by increasing the sample size and adding a two-week follow-up assessment to examine the short-term effects of the experimental manipulation. A study of this nature is needed for theoretical as well as practical reasons. First, there is virtually no evaluative work on the pro-dieting, obesity prevention message, which has been widely disseminated by public health agencies and the media. In light of the findings from the pilot study that exposure to these messages increased perceived pressure to lose weight, a construct which research has consistently found to have deleterious effects on women and girls, it is imperative that the effects of the pro-dieting, obesity prevention messages on psychological functioning and eating and weight control practices be explored further. Second, no research to date has examined the effects of the pro-dieting and anti-dieting messages on healthy eating and weight control practices.

Given that both messages share a goal of increasing healthy eating and weight control behaviors, which in turn promotes the reduction of disease, addressing this gap in the extant literature is important. Third, no study has directly compared the effects of the pro-dieting and anti-dieting messages on immediate and short-term psychological functioning and weight control intentions and behaviors. Lastly, there is still very little experimental work which has evaluated the effect of perceived pressure to lose weight on internalization of the thin-ideal, body dissatisfaction, affect, and eating and weight control intentions and behaviors. An experimental study that induces change in this construct allows for the examination of causal risk factor status according to the criteria proposed by Kraemer et al (1997). While perceived pressure to be thin has received support in cross-sectional and longitudinal studies as a risk factor for eating disordered symptoms (Stice, 2002), additional experimental research is needed to examine the effect of the perceived pressures construct on eating disordered symptoms and other weight control practices.

Accordingly, the goals of the current study are: (1) to experimentally manipulate the dieting and weight loss messages to determine their immediate effects on (a) perceived pressure to lose weight and/or maintain a low body weight, (b) psychological functioning, including body dissatisfaction, negative affect, and thin-ideal internalization, and (c) eating and weight-control intentions, including both healthy and unhealthy strategies of dieting, exercise, healthy eating, and bulimic symptoms, (2) to examine the impact of the dieting and weight loss messages over a two-week period on the same psychological variables and eating and weight control behaviors, (3) to test whether perceived pressure to lose weight from the experimental message mediates the relationship between dieting

message and weight control intentions and two-week follow-up behaviors, and (4) to evaluate the risk factor status of the perceived pressure construct for bulimic symptomatology utilizing Kraemer et al.'s (1997) criteria.

Based on the literature as well as findings from the pilot study, the following hypotheses are offered: (1) Participants in the pro-dieting condition will perceive greater pressure to lose weight from the psychoeducational message than those in the anti-dieting and no-dieting conditions. (2) Participants in the pro-dieting condition will report significantly greater disturbances in psychological functioning and intentions to engage in weight loss strategies immediately after exposure to the psychoeducational message than those participants in the other two conditions. Specifically, it is hypothesized that state body dissatisfaction, intentions to diet, exercise, eat more healthfully, utilize unhealthy weight control practices, and engage in thin-ideal thinking and behavior will be greater in the pro-dieting condition than the anti-dieting and no-dieting conditions. No differences in negative affect among the groups are hypothesized at post-test based on the findings of the pilot study. (3) Trait levels of body dissatisfaction, thin-ideal internalization, drive for thinness, perceived pressure to be thin, negative affect, dieting, bulimic symptoms, healthy eating, and exercise will increase from pre-test to the two-week follow-up in the pro-dieting condition compared to the anti-dieting and no-dieting conditions (4) Perceived pressure to lose weight from the psychoeducational message will mediate the hypothesized increase in weight control intentions at post-test and behaviors at the two-week follow-up. (5) The findings will indicate that the pressures construct will meet Kraemer et al.'s (1997) criteria for a causal risk factor for bulimic symptomatology in college women.

Chapter 2

Method

Participants

The participants were 139 undergraduate females who were recruited from the University of South Florida's Department of Psychology participant pool. They ranged in age between 18 and 30 ($M = 20.63$, $SD = 2.51$). The sample was racially diverse with 18% African-American ($N = 25$), 6.5% Asian/Pacific Islander ($N = 9$), 49.6% Caucasian ($N = 69$), 17.3% Hispanic ($N = 24$), 0.7% Native American ($N = 1$), and 7.9% Other ($N = 11$). Self-reported weight and height revealed that the average body mass index (BMI) was in the normal range ($M = 24.31$, $SD = 6.05$) with scores ranging from 17 to 62. 6.5% were underweight ($N = 9$; BMI = 18.5 or lower), 61.9% were average weight ($N = 86$; BMI = 18.51-24.49), 15.1% were overweight ($N = 21$; BMI = 25-29.99), and 16.5% were obese ($N = 23$; BMI = 30.0 or higher) with no current or past history of an eating disorder diagnosis or current purging behaviors reported. Participants were compensated with extra credit points in their psychology course(s).

Measures

Demographic information. Participants were asked to provide demographic information including age, race, height, weight, and year in school. Body mass index

(BMI) was calculated using self-reported weight and height with the standard formula:
[(weight in pounds/(height in inches)²] X 703.

Body dissatisfaction: Two measures of body dissatisfaction were utilized: one trait measure and one state measure. The Eating Disorder Inventory - Body Dissatisfaction subscale (EDI-BD, see Appendix J) (Garner, Olmsted, & Polivy, 1983) was used as the trait measure of body dissatisfaction. The EDI-BD is a 7-item scale that assesses overall satisfaction with various weight related body sites. It has demonstrated good reliability (alphas above .80) across varied samples in previous studies (Garner, 1991; Thompson, 1992). Cronbach's alpha in this study was .89. The EDI-BD was administered at baseline and follow-up.

The Visual Analogue Scales (VAS, see Appendix F) was utilized to assess state dissatisfaction with body weight and shape (Heinberg & Thompson, 1995). On these scales, participants are asked to indicate their level of dissatisfaction on a 100 mm line, with the left-most point being "no weight/size dissatisfaction" ("no overall appearance dissatisfaction") and the right-most point being that of "extreme weight/size dissatisfaction" ("extreme overall appearance dissatisfaction"). The distance from the left-most point on the line (0) measured in millimeters indicates the level of distress (Thompson et al., 1999). The VAS has been found to correlate highly with the Eating Disorder Inventory-Body Dissatisfaction subscale (e.g., Heinberg & Thompson, 1995) and has been widely-used because it may reduce the level of pre-test sensitization on post-test responses (Thompson, 2004b). The VAS assessed weight and shape dissatisfaction pre- and post- exposure to the experimental manipulation of the psychoeducational message.

Thin-ideal internalization. The Sociocultural Attitudes Towards Appearance Scale-3 (SATAQ-3, see Appendix K)-Internalization subscale was used to assess trait levels of thin-ideal internalization (Thompson et al., 2004). This measure focuses specifically on internalization of media messages regarding the thin-ideal, and ratings are made on a five-point Likert scale ranging from “Definitely Agree” to “Definitely Disagree.” The SATAQ-3 has two internalization subscales with excellent reliability: Internalization-General (Cronbach’s alpha = .96) and Internalization-Athlete (Cronbach’s alpha = .95) (Thompson et al., 2004). In this sample, Cronbach’s alpha revealed good reliability for both subscales: Internalization-General=.94 and Internalization-Athlete=.85.

Additionally, 5 items from the SATAQ-3 Internalization-General and Athlete subscales were modified and utilized in the pilot and full studies to assess the impact of the psychoeducational messages on future thin-ideal thoughts and behaviors at post-test (see Appendix H). All SATAQ-3 stem phrases were retained, but wording was changed to reflect the impact of the psychoeducational message on thin-ideal intentions. For instance, one of the modified items stated, “Reading this article makes me want to compare my body to that of people in good shape.” General and athlete items were summed to obtain a composite modified Internalization score. Internal consistency of the modified measure was acceptable in the pilot study (Cronbach’s alpha=.76) and full study (Cronbach’s alpha=.90).

Sociocultural pressure. The Sociocultural Attitudes Towards Appearance Scale-3 (SATAQ-3; Thompson et al., 2004) Pressures subscale (see Appendix K) was administered during the pre-test and follow-up assessments to examine perceived

sociocultural pressures to be thin. The Pressures subscale consists of six, Likert scale items and has demonstrated excellent reliability (Cronbach's $\alpha=.94$) and convergent validity (Thompson et al., 2004).

A modified, five-item version of the SATAQ-3 Pressures subscale (Thompson et al., 2004) was developed for the pilot and full studies to assess the extent to which participants perceived pressure from the experimental message to lose weight and/or maintain a low body weight (see Appendix H). Items modified for this study retained the SATAQ-3 stems but changed the cited source of perceived pressure from TV, movies, and magazines to the psychoeducational message. For example, an original item on the Pressures subscale was modified from, "I've felt pressure from TV or magazines to lose weight," to "I've felt pressure from this article to lose weight." Items were summed to obtain a composite pressures score. Internal consistency of the modified measure was .78 in the pilot and full study. Item-total analyses revealed that the internal consistency of the measure improved to .90 by deleting item 13 ("I felt pressure from this article to avoid dieting."); therefore, all analyses were conducted on the four-item subscale.

Drive for thinness. The Eating Disorder Inventory-Drive for Thinness (EDI-DT; See Appendix J, Garner et al., 1983) was used to measure drive for thinness. This scale measures restricting tendencies, desire to lose weight, and fear of weight gain. It has been shown to have an internal consistency of .83 for a combined sample of eating disordered individuals and .81-.91 for four samples of nonpatient female controls (Garner, 1991). The EDI-DT was administered at pre-test and the two-week follow-up, and the directions were modified to assess usual and past two-week drive for thinness. Reliability was excellent with an alpha of .91 in this sample.

Dieting. The Dutch Eating Behavior Questionnaire-Restraint Scale (DEBQ-RS; see Appendix L, van Strien, Frijters, Bergers, & Defares, 1986) was used to assess dieting intentions and behavior. This scale consists of ten-items that measure the frequency of dieting behaviors using a 5-point Likert scale, which ranges from “never” to “always.” The DEBQ has been shown to have good internal consistency (Cronbach’s $\alpha=.95$) and test-retest reliability ($r=.92$) (Allison, Kalinsky, & Gorman, 1992). The original DEBQ-RS was administered at pre-test and two-week follow-up to assess usual and past 2 week behavior, respectively. Directions were modified to assess intentions to diet at post-test. Reliability of the DEBQ-RS was excellent (Cronbach’s $\alpha=.92$) in this sample.

Negative affect. The Positive Affect and Negative Affect Scale-Revised, Negative Affect subscale (PANAS-X; see Appendix G, Watson & Clark, 1992) was used to assess both state and trait negative affect. State negative affect was assessed pre- and post- manipulation of the psychoeducational message, and trait negative affect was assessed at pre-test and the two-week follow-up. In this scale, participants rate 20 negative emotional states (e.g., sadness, guilt, and fear/anxiety) currently or over the past two weeks. A 5-point Likert scale, which ranges from “very slightly or not at all” to “extremely,” is used. This scale has been found to have adequate internal consistency, test-retest reliability, convergent and divergent validity, and predictive validity (Stice & Agras, 1998; Watson & Clark, 1992). Reliability was very high (Cronbach’s $\alpha=.95$) in this sample.

Visual Analogue Scales related to affect were used as filler questions to disguise the main purpose of the VAS scales—to assess state body dissatisfaction (see Appendix

F). Following the same procedure described above for the measurement of state weight and shape dissatisfaction, participants will be asked to rate the extent of their current affect on several dimensions, including happiness, anxiety, energy level, disappointment in self, anger, calmness, and irritability.

Bulimic symptoms. The Eating Disorder Examination-Questionnaire (EDE-Q; see Appendix M, Fairburn & Beglin, 1994) Bulimia Subscale was used to measure bulimic symptoms at pre-test and the two-week follow-up. The EDE-Q is derived from the Eating Disorder Examination (EDE; Fairburn & Cooper, 1993), which is a widely used and validated semistructured interview. The EDE-Q Bulimia Subscale consists of twelve items that assess the frequency of binge eating and purging (i.e, vomiting, laxative and diuretic use, excessive exercising). The frequency is measured in terms of the number of days that binging and/or purging occurred as opposed to the number of individual episodes. The internal consistency of the EDE-Q has been found to be adequate (Cronbach's $\alpha=.84$) (Fairburn & Beglin, 1994). In addition, the EDE-Q demonstrates acceptable criterion validity and convergent validity (Black & Wilson, 1996). Alpha was .77 in this sample.

A six-item modified version of the EDE-Q was also developed for this study to assess unhealthy weight control intentions (see Appendix N). Items 10-12, which assess compensatory behavior frequency, were adapted to measure intentions to vomit, use laxatives/diuretics, and excessive exercise to control weight on a five-point Likert scale. Additionally, items related to intentions to use diet pills, fasting, smoking, and meal skipping as weight control practices were added to the scale. Reliability of this modified

measure was low (Cronbach's alpha= .59), and item-total analyses did not indicate any improvements if any item was deleted from the scale.

Eating disorder screening. In an attempt to minimize any risk associated with the study that might potentially affect individuals with a high level of eating disturbance, potential participants were administered screening questions via USF Experiment Trak from the Eating Disorder Inventory (EDI)-3 Referral Form (Garner, 2005, see Appendix O), which is designed to identify individuals at risk for an eating disorder or with a past history of an eating disorder. Five Likert-scale items ranging from "Never" to "Once a Day or More" were utilized to assess current eating disordered symptomatology such as "Over the past three months, how often have you used laxatives to control your weight or shape?" Additionally, a yes/no question asked potential participants whether they have ever been diagnosed or treated for an eating disorder. Evidence of past history of an eating disorder or active purging episodes excluded potential participants from the study, and they were blocked from enrolling in the study.

Healthy eating. The Multidimensional Health Behavior Inventory- Diet subscale (MHBI; Kulbok, Carter, Baldwin, Gilmartin, & Kirkwood, 1999; see Appendix P) was utilized to assess healthy eating intentions and behaviors. The MHBI is a psychometrically sound instrument that was developed for use in adolescent and college-aged samples. The MHBI-Diet subscale consists of 13 items assessing frequency of healthy nutritional behaviors such as eating whole grain foods and limiting sugar intake on a 5-point Likert scale ranging from "Never" to "Always." Internal consistency of the Diet subscale has been found to be very good (Cronbach's alpha=.88) (Kulbok et al., 1999). Directions were modified to assess usual behavior, intentions, and past two week

behavior. In addition to the original MHBI items, two questions regarding fruit and vegetable consumption were added using the MHBI stems. Cronbach's alpha was found to be .79 in the current study; item-total analyses revealed that reliability improved to .84 when item 32 ("Eat at least one or more of the following items every day: chips, candy bars, cake, doughnuts, pastries, muffins, cookies, ice cream, pudding, chocolate") was deleted. All analyses were conducted with item 32 deleted from the scale.

Exercise. The Multidimensional Health Behavior Inventory- Exercise subscale (MHBI; Kulbok et al., 1999; see Appendix P) was used to assess exercise intentions and behaviors. The MHBI-Exercise subscale consists of four items on the same five-point Likert scale described above for the MHBI-Diet subscale. Items assess frequency of physical activity such as vigorous exercise for at least 20 minutes a day, three times a week. Kulbok et al. (1999) demonstrated the scale has acceptable internal consistency (Cronbach's alpha=.80) and content and convergent validity. Test-retest reliability was not assessed. Directions were changed to assess usual, intended, and past two-week exercise behavior. Cronbach's alpha was .86 in this sample, suggesting good reliability.

Flu prevention intentions and behaviors. The MHBI- Checkup and Stress/Rest subscales (Kulbok et al., 1999; see Appendix P) were utilized to assess intentions and behaviors advocated in the flu prevention message for the purposes of face validity. The Stress/Rest subscale consists of six items that measure frequency of self-care and stress reduction behaviors such as sleeping 7-8 hours per night on a five-point Likert scale. Cronbach's alpha was acceptable (.76) for this subscale (Kulbok et al., 1999). Directions were modified to assess usual, intended, and past two-week behaviors.

The Checkup subscale of the MHBI is a 9-item scale that assesses the frequency of routine health care such as regular physical checkups and monthly self breast exams on a five-point Likert scale. Internal consistency of this subscale is good (Cronbach's $\alpha=.82$) (Kulbok et al., 1999). Some items from the original scale were modified to include behavior related to flu prevention such as receive a flu shot and wash hands frequently, and directions were modified to assess usual, intended, and past two-week behaviors.

Message rating form. A modified version of the Message Rating Form (Sperry et al., 2004; see Appendix I) was utilized in the pilot and full studies to assess non-specific factors of the messages at post-test. The extent to which the messages were perceived as convincing, effective, applicable, easy to understand, credible, and influential were rated on a five-point Likert scale ranging from "Definitely Disagree" to "Definitely Agree." An alpha of .65 was obtained in the pilot study, and Cronbach's alpha was .82 in the full study.

Attention check. Five true/false questions were created for each condition to serve as an attention check. Efforts were made to include relevant information from each message in the attention check and to equate the items for each condition. Questions related to prevalence, prevention, and symptom presentation. These items were administered immediately after the participant finished reading the psychoeducational information. Because no participants failed the attention check in the pilot study, the items were re-worked for the full study in an effort to increase item difficulty to ensure that participants were attending to the messages (see Appendix R). Participants who

answered fewer than four out of the five items correctly were excluded from further analyses.

Distraction task. A distraction task was utilized after all trait measures were obtained as a washout period prior to the administration of the pre-test measures, experimental manipulation, and post-test measures. Nolen-Hoeksema and colleagues have found that brief (5-8 minutes), externally-focused, active tasks return experimentally-induced dysphoric mood states back to baseline levels (Lyubomirsky & Nolen-Hoeksema, 1993, 1995; Morrow & Nolen-Hoeksema, 1990). Therefore, a similar procedure was used in the current study to counter any negative affect induced as a result of completing the pre-test trait measures. Participants were asked to spend 5-8 minutes thinking about the countries of the world and then to write a list of their top ten travel destinations as well as their perceptions of how the media portrays these destinations (see Appendix S).

Procedure

Participants enrolled in the study via USF Experiment Trak. To minimize any potential risks associated with the study, potential participants were prescreened through Experiment Trak using the EDI-3 RF and a question about past eating disorder history. Any participant who reported a current or past history of an eating disorder or current purging behavior was excluded from the study and was unable to enroll in it.

Participants were randomly assigned to one of the three experimental conditions: (1) pro-dieting message (obesity prevention), (2) anti-dieting message (eating disorder prevention), and (3) no dieting message (flu prevention). The study was conducted in a

group setting in classrooms, and participants were instructed to sit at least one seat apart so that they were unable to read one another's testing materials. They were told that the study examined "mood, health, and the media." Participants provided the last four digits of their social security number as their study identification number in order to easily link participant data from both sessions.

Testing packets for each of the three conditions were stacked consecutively by condition (i.e., 1, 2, 3, 1, 2, 3, etc.) and handed out randomly to participants; the measures were in the following order: demographic information, trait measures using the SATAQ-3, EDI-BD, EDI-DT, PANAS-X, DEBQ-RS, EDE-Q, and MHBI, the distraction task, the pre-test VAS and PANAS-X measures. Immediately after completion of the pre-test measures, participants read the experimental stimuli and completed the attention check items, Message Rating Form, modified SATAQ-3 Pressures and Internalization scales, and post-test VAS and PANAS-X measures. The MHBI, DEBQ-RS, and EDE-Q behavioral intention questionnaires were then administered. After participants handed in their completed measures, they were asked to schedule their appointment for the two-week follow-up assessment. Participants' email addresses and phone numbers were obtained at this point in order to provide reminder calls to minimize attrition rates.

The two-week follow-up assessment was also conducted in a group setting, and participants were given a packet of questionnaires to assess past two-week body dissatisfaction, thin-ideal internalization, negative affect, dieting, bulimic symptoms, healthy eating, exercise, drive for thinness, and perceived pressure to be thin using the same measures from the baseline assessment. Directions were changed on each measure to instruct participants to answer the questions based on their feelings and behaviors

“over the past two weeks.” After completing the follow-up packet, participants were fully debriefed and awarded their extra credit points.

Design and Analyses

Any participant who failed the attention check (< 4 out of 5 true/false items correct) or did not attend the second session was dropped from the study analyses. Preliminary analyses were conducted to test for any initial differences among the conditions as well as to determine if there were differences between participants who were dropped from the study because they failed the manipulation check and those retained for the study. Demographic variables and baseline trait levels of body dissatisfaction (EDI-BD), thin-ideal internalization (SATAQ-3), perceived pressure to be thin (SATAQ-3), drive for thinness (EDI-DT), negative affect (PANAS-X), dieting (DEBQ-RS), bulimic symptoms (EDE-Q), healthy eating (MHBI), and exercise (MHBI) as well as the pre-test state VAS and PANAS-X measures were computed by condition using one-way ANOVAs for continuous variables and χ^2 for categorical variables. Differences among the ratings of the psychoeducational message items (MRF) were also analyzed in separate one-way ANOVAs.

A series of ANCOVA analyses were computed to test the hypotheses related to group differences. Hypothesis 1 stated that there would be significant post-test differences among the groups on perceived pressure to lose weight with the pro-dieting message eliciting greater pressure than the anti-dieting and no-dieting message conditions. To test this hypothesis, a one-way ANCOVA was computed on the modified

SATAQ-3 Pressures scale with the baseline SATAQ-3 Pressures scale used as a covariate.

To test Hypothesis 2, which stated that post-test body dissatisfaction and intentions to diet, exercise, eat more healthfully, utilize unhealthy weight control practices, and engage in thin-ideal thinking and behaviors would be significantly greater in the pro-dieting message condition than the anti-dieting and no-dieting conditions immediately after the experimental manipulation, separate one-way ANCOVAs were computed using baseline scores as the covariate on the modified version of the SATAQ-3 Internalization subscale, EDE-Q, DEBQ-RS, MHBI Exercise and Healthy Eating subscales, and EDI-DT. One-way ANCOVAs were computed on post-test VAS weight and shape dissatisfaction and PANAS-X scores with the baseline and pre-test state scores used as covariates to analyze for changes in state body dissatisfaction and negative affect. Additionally, exploratory analyses were conducted to examine the role of participant weight status on these outcomes. The same analyses described above were conducted adding weight status (overweight vs. non-overweight) as an additional between-subjects factor, resulting in a series of 3 (Condition) X 2 (Weight Status) Between Subjects ANCOVAs.

Hypothesis 3, which stated that body dissatisfaction, thin-ideal internalization, perceived pressure to be thin, negative affect, dieting, bulimic symptoms, healthy eating, and exercise would increase significantly from baseline to follow-up in the pro-dieting message condition compared to the anti-dieting and no-dieting message conditions, was examined using separate 3 (Experimental Condition) X 2 (Time: Baseline, Two Week Follow-Up) repeated measures ANOVAs on the EDI-BD, EDI-DT, SATAQ-3, EDE-Q,

MHBI, DEBQ-RS, and PANAS-X. Separate exploratory analyses were conducted on the above measures with weight status (not overweight vs. overweight) as an additional between subjects factor.

To test hypothesis 4, which stated that perceived pressure to lose weight from the psychoeducational message would mediate weight control intentions and behaviors, Baron and Kenny's (1986) procedure for assessing mediation was utilized. According to Baron and Kenny (1986), the following conditions must be met to establish mediation: (1) the independent variable (diet message) must affect the mediator variable (perceived pressure), (2) the independent variable (diet message) must affect the dependent variable (weight control intentions/behaviors), (3) the mediator (perceived pressure) must affect the dependent variable (weight control intentions/behaviors), and (4) the effect of the independent variable (diet message) on the dependent variable (weight control intentions/behaviors) should be near zero when controlling for the mediator variable (perceived pressure). The Sobel test was computed for each analysis that met the Baron and Kenny (1986) criteria to test the significance of the mediational effect.

Exploratory moderational analyses were also conducted using trait levels of thin-ideal internalization (SATAQ-3) as the moderator variable, diet message as the predictor, and post-test perceived pressure and weight control intentions and behaviors as the outcome variables. According to Baron and Kenny (1986), the moderator hypothesis is supported if the interaction between the predictor and the moderator is significant after controlling for the effects of the predictor and the moderator in the regression analyses.

Based on the recommendations of Kraemer, Wilson, Fairburn, and Agras (2002), which state that treatment groups can be directly compared in mediational and

moderational analyses in randomized control trials, the two dieting messages (pro-dieting vs. anti-dieting) were directly compared in the current mediational and moderational analyses. The pro-dieting message was coded as .5 and the anti-dieting message was coded as -.5 in the regression analyses as recommended by Kraemer et al. (2002). If trait levels of a dependent variable were assessed at pre-test, these scores were used as a covariate in each of the regression equations for that outcome variable in the mediational and moderational analyses (Kenny, 2006).

Hypothesis 5, which stated that perceived pressure to lose weight/maintain a thin body would meet Kraemer et al.'s (1997) criteria as a causal risk factor for bulimic symptomatology, was evaluated by examining the findings from the one-way ANOVAs by condition for post-test perceived pressure and post-test bulimic intentions and the mixed model ANOVA (condition by time) for follow-up bulimic behaviors. For Hypothesis 5 to be supported, two conditions had to be met. First, a significant difference among the groups in post-test perceived pressure to lose weight had to be found, with the pro-dieting message eliciting significantly higher levels than the anti-dieting and no-dieting message conditions (Hypothesis 1). Second, the ANOVAs for post-test bulimic intentions and past two-week bulimic behaviors had to reveal significantly greater bulimic symptomatology in the pro-dieting condition than the anti-dieting and no-dieting conditions.

Skewness and kurtosis values were examined for all outcome variables, and all variables were within the acceptable ranges. Pearson Product Moment and Point-Biserial correlations were computed for all continuous and categorical dependent variables, respectively. The modified Bonferroni procedure was utilized on all follow-up

comparisons to control Type I error rate while maintaining a higher degree of statistical power than the traditional, more conservative Bonferroni correction (Kromrey & Dickinson, 1995; Simes, 1986). All analyses were performed with SPSS 14.0.

Chapter 3

Results

Preliminary Analyses

Sixteen participants were excluded from the study analyses, leaving a sample size of 123. The sample sizes per condition were: pro-dieting ($N = 46$), anti-dieting ($N = 37$), and no-dieting ($N = 40$). There was little overlap between the two exclusion criteria: inattention and attrition. Ten participants failed the attention check, and 7 did not return for the second session; only one participant failed the attention check and did not return for the second session. Overall, there was a marginally significant effect for condition by exclusion status, $\chi^2(2) = 5.48, p > .05$, with 2 participants excluded from the pro-dieting, 9 from the anti-dieting, and 5 from the no-dieting conditions. Upon examining exclusion status more closely, a significant difference among conditions was found for those who failed the attention check, $\chi^2(2) = 6.27, p < .05$, with more participants failing the anti-dieting ($N = 6$) and no-dieting ($N = 4$) than the pro-dieting ($N = 0$) conditions; however, no differences emerged by condition for attrition rates, $\chi^2(2) = 2.11, p > .05$, and rates were roughly equal among the pro-dieting ($N = 2$), anti-dieting ($N = 4$), and no-dieting ($N = 1$) groups. No significant differences were found for exclusion status by race (collapsed into Caucasian vs Non-Caucasian because of small N 's in most cells), $\chi^2(1) = 2.45, p > .05$, or age, $t(17) = -1.5, p > .05$, and BMI, $t(16) = -.72, p > .05$, after adjusting for the significant inequality of variances based on Levene's test.

One-way ANOVAs confirmed there were no significant differences among conditions on age, $F(2, 122) = 2.09, p > .05$, BMI, $F(2, 122) = .29, p > .05$, or year in school, $F(2, 122) = .78, p > .05$. Additionally, no significant difference was found among conditions for race, $\chi^2(8) = 9.06, p > .05$. Separate one-way ANOVAs on each pre-test trait and state variable revealed no significant differences among the conditions. Collectively, these findings suggest that random assignment was successful.

The Message Rating Form (MRF) items were analyzed separately in one-way ANOVAs to test for differences in non-specific perceptions of the three messages. The MRF items assessed the extent to which participants rated the messages as convincing, effective, applicable to themselves, easy to understand, credible, and influential. A significant difference was found among the conditions for the applicable item, $F(2, 123) = 5.35, p < .05$, with the modified Bonferroni post-hoc test revealing that the anti-dieting, eating disorder prevention message was perceived as less applicable ($M = 2.57$) than the pro-dieting, obesity prevention ($M = 3.26$) and no-dieting, flu prevention ($M = 3.53$) messages. The messages were found to be equivalent on all other MRF items. Examination of mean values (see Table 2) shows that means ranged between 3 and 4, suggesting that the messages were generally perceived positively. Overall, findings indicate that the messages appear to be equated on the non-specific factors with the exception of the lowered applicability of the anti-dieting, eating disorder prevention message.

Table 2

Means and Standard Deviations for Message Rating Form Items by Condition

	Pro-Dieting	Anti-Dieting	No-Dieting
Convincing	4.02 (1.09) _a	3.78 (.98) _a	4.10 (.81) _a
Effective	3.80 (1.03) _a	3.62 (.9) _a	4.05 (1.01) _a
Applicable	3.26 (1.56) _a	2.57 (1.26) _b	3.53 (1.06) _a
Easy to Understand	4.48 (.75) _a	4.46 (.99) _a	4.65 (.53) _a
Credible	3.61 (1.09) _a	3.54 (.90) _a	3.68 (1.0) _a
Influential	3.13 (1.36) _a	3.11 (1.08) _a	3.53 (.78) _a

Note. Letter subscripts indicate significant differences across conditions.

Correlations among the pre-test trait and state measures were examined (see Table 3). The correlation between the pre-test VAS weight dissatisfaction and body shape dissatisfaction items was very high ($r = .91$), suggesting the two items were not independent. Therefore, the two items were collapsed, and a state body dissatisfaction composite score was created for both pre-test and post-test. The VAS composite state body dissatisfaction scores were used in all subsequent analyses. As Table 3 illustrates, many of the pre-test trait variables were significantly correlated (magnitude of r 's ranging from .02 to .78), which was expected based on previous research which has suggested these are theoretically related yet distinct constructs (i.e., body dissatisfaction is associated with dieting yet is a distinct behavior). Healthy eating and exercise, however, were not correlated with several of the pre-test variables. Because all trait measures were not correlated, it appeared to be most appropriate to proceed with separate univariate ANOVAs as planned rather than conducting multivariate analyses.

The correlations between baseline and post-test scores (post-test perceived pressure, state body dissatisfaction and negative affect, and intentions) were examined for each variable. All of the correlations were statistically significant with an alpha level of less than .01 (r's ranging from .35-.85). Because of these high correlations between baseline and post-test scores, the baseline scores were used as covariates in subsequent analyses to reduce within-group error variance and increase the power to detect the effect of the independent variable (Field, 2000).

Table 3

Correlations Among Pre-Test Measures

	State BD	State PANAS	Trait PANAS	MHBI-Exercise	MHBI-Healthy Eating	EDI-BD	EDI-DT	SATAQ-Pressures	SATAQ-General	SATAQ-Athlete	EDEQ	DEBQ
State BD	1											
State PANAS	.49**	1										
Trait PANAS	.51**	.86**	1									
MHBI-Exercise	-.02	-.21*	-.16	1								
MHBI-Healthy Eating	.09	-.11	-.04	.45**	1							
EDI-BD	.73**	.36**	.45**	.02	.14	1						
EDI-DT	.64**	.30**	.40**	.25**	.30**	.66**	1					
SATAQ-Pressures	.40**	.19*	.28**	.22*	.20*	.43**	.49**	1				
SATAQ-General	.36**	.28**	.30**	.19*	.13	.30**	.37**	.74**	1			
SATAQ-Athlete	.30**	.14	.18*	.38**	.17	.22*	.29**	.48**	.57**	1		
EDEQ	.75**	.39**	.48**	.10	.09	.62**	.65**	.44**	.37**	.39**	1	
DEBQ	.48**	.16	.29**	.30**	.47**	.47**	.78**	.38**	.20*	.21*	.51**	1

Note.

BD: Composite Body Dissatisfaction; PANAS: Positive and Negative Affect Scale; MHBI: Multidimensional Health Behavior Inventory; EDI-BD: Eating Disorder Inventory-Body Dissatisfaction subscale; EDI-DT: Eating Disorder Inventory-Drive for Thinness subscale; SATAQ: Sociocultural Attitudes Towards Appearance Scale; EDEQ: Eating Disorder Examination Questionnaire-Bulimia subscale; DEBQ: Dutch Eating Behavior Questionnaire-Restraint scale

* p<.05

** p<.01

Planned ANOVA and ANCOVA Analyses

Univariate ANCOVAs. Separate one-way ANCOVAs were computed to examine post-test differences in perceived pressure and weight control intentions (Hypotheses 1 and 2). As Table 4 illustrates, a significant main effect was found for perceived pressure, $F(2, 123) = 79.99, p < .0001, \text{partial } \eta^2 = .57$. The modified Bonferroni revealed significant differences among all three conditions with the pro-dieting message (adjusted $M = 12.19$) yielding greater perceived pressure than the anti-dieting message (adjusted $M = 6.33$), which was greater than the no-dieting message (adjusted $M = 4.7$). A significant main effect was also found for dieting intentions, $F(2, 121) = 13.64, p < .0001, \text{partial } \eta^2 = .19$. The pro-dieting condition (adjusted $M = 31.75$) had significantly greater intentions to diet at post-test than the no-dieting condition (adjusted $M = 29.20$), which was significantly greater than the anti-dieting condition (adjusted $M = 25.13$). There was also a significant main effect for internalization intentions, $F(2, 123) = 36.96, p < .0001, \text{partial } \eta^2 = .38$, with the pro-dieting condition having significantly greater internalization intentions (adjusted $M = 11.61$) than the anti-dieting (adjusted $M = 7.09$), which was significantly greater than the no-dieting condition (adjusted $M = 5.54$). A significant main effect was found for bulimic intentions, $F(2, 122) = 3.22, p < .05, \text{partial } \eta^2 = .05$. The modified Bonferroni procedure revealed a significant difference between the anti-dieting (adjusted $M = 7.56$) and the no-dieting (adjusted $M = 8.97$). There was no difference between the pro-dieting message (adjusted $M = 8.77$) and the other two messages. The ANCOVA analyses revealed no significant differences by condition for healthy eating intentions or exercise intentions.

To assess differences by condition for post-test state measures (body dissatisfaction and negative affect), separate ANCOVAs were computed with baseline and pre-test state measures entered as covariates (Hypothesis 2). The hypotheses for state differences at post-test were not supported (see Table 4). There was not a significant main effect for post-test state body dissatisfaction when baseline and pre-test scores were controlled.

Repeated measures ANOVAs. To test Hypothesis 3, separate mixed design, repeated measures ANOVAs were computed to evaluate any changes in psychological functioning and weight control behaviors from pre-test to follow-up (see Table 4). For the psychological functioning variables, there was a significant time by condition interaction for the SATAQ-3 Pressures subscale, $F(2, 120) = 4.46, p < .01, \text{partial } \eta^2 = .07$, with significant decreases in perceived pressure found for the anti-dieting ($M_1 = 18.5; M_2 = 16.84$) and no-dieting ($M_1 = 19.13; M_2 = 15.3$) conditions, but no changes across time found for the pro-dieting condition ($M_1 = 20.3; M_2 = 19.15$). A significant time by condition interaction was also found for the SATAQ-3 Internalization-Athlete subscale, $F(2, 120) = 3.91, p < .05, \text{partial } \eta^2 = .06$; the no-dieting condition exhibited significant decreases from pre-test to follow-up ($M_1 = 15.25; M_2 = 13.65$). A marginally significant decrease in SATAQ-3 Internalization-Athlete scores was also seen in the anti-dieting condition ($M_1 = 16.32; M_2 = 15.38$) while no changes were seen in the pro-dieting condition ($M_1 = 16.72; M_2 = 16.87$). A main effect for time was found for drive for thinness, $F(1, 118) = 11.44, p < .001, \text{partial } \eta^2 = .09$, with drive for thinness decreasing from pre-test ($M = 21.43$) to follow-up ($M = 20.05$). The time by condition interaction for drive for thinness was non-significant. A main effect over time was also found for

negative affect, $F(1, 118) = 7.92$, $p < .01$, partial $\eta^2 = .06$, with negative affect scores decreasing from pre-test to follow-up across conditions. The time by condition interaction for negative affect was non-significant. No significant time or time by condition effects were found for body dissatisfaction or general thin-ideal internalization.

For the weight control outcome variables, a significant time by condition interaction was found for healthy eating, $F(2, 118) = 7.97$, $p < .001$, partial $\eta^2 = .12$. The modified Bonferroni procedure revealed significant increases in healthy eating in the pro-dieting condition ($M_1 = 38.5$; $M_2 = 42.17$), but no changes in either the anti-dieting ($M_1 = 40.0$; $M_2 = 39.43$) or no-dieting condition ($M_1 = 40.48$; $M_2 = 41.23$). A significant main effect for dieting across time was found, $F(1, 118) = 12.36$, $p < .001$, partial $\eta^2 = .10$, with dieting behaviors decreasing from pre-test ($M = 25.85$) to follow-up ($M = 23.88$). The time by condition interaction for dieting was non-significant. There were no significant effects for bulimic symptoms or exercise behaviors across time or time by condition.

Table 4.

Means, standard deviations, F, p, and partial η^2 values for planned ANOVAs

Univariate ANCOVAS	Pro-Dieting (Adjusted means & SE)	Anti-Dieting (Adjusted means & SE)	No-Dieting (Adjusted means & SE)	F, p, partial η^2 values
Perceived Pressure	12.19 (.43) _a	6.33 (.48) _b	4.7 (.46) _c	F(2,123)=79.99, p<.0001, partial η^2 =.57
Dieting Intentions	31.75 (.85) _a	25.13 (.95) _b	29.20 (.93) _c	F(2,121)=13.64, p<.0001, partial η^2 =.19
Internalization Intentions	11.61 (.50) _a	7.09 (.56) _b	5.54 (.54) _c	F(2,123)=36.96, p<.0001, partial η^2 =.38
Bulimic Intentions	8.77 (.40)	7.56 (.44) _a	8.97 (.42) _b	F(2,122)=3.22, p<.05, partial η^2 =.05
Healthy Eating Intentions	48.00 (.93) _a	44.97 (1.05) _a	46.3 (1.0) _a	F(2,123)=2.37, p=.10
Exercise Intentions	15.11 (.47) _a	14.9 (.53) _a	14.97 (.51) _a	F(2,123)=.05, p>.05
State Body Dissatisfaction	93.52 (4.6) _a	81.64 (5.21) _a	81.81 (4.95) _a	F(2,122)=2.05, p>.05
State Negative Affect	32.59 (.69) _a	30.56 (.76) _a	31.19 (.73) _a	F(2,121)=2.12, p>.05

Repeated Measures ANOVAs	Baseline (M & SD)	Baseline (M & SD)	Baseline (M & SD)	
	Follow-Up (M & SD)	Follow-Up (M & SD)	Follow-Up (M & SD)	
Perceived Pressures	20.30 (7.11) ₁	18.49 (6.96) ₁	19.13 (6.01) ₁	T: F(1,120)=31.71, p<.001, partial η^2 =.21
	19.15 (7.62) ₁	16.84 (6.27) ₂	15.30 (5.95) ₂	C: F(2,120)=1.93, p>.05 TxC: F(2,120)=4.46, p<.05, partial η^2 =.07
Internalization-Athlete	16.72 (4.88) ₁	16.32 (3.99) ₁	15.25 (4.79) ₁	T: F(1,120)=8.97, p<.01, partial η^2 =.07
	16.87 (5.44) ₁	15.38 (5.07) ₁	13.65 (5.15) ₂	C: F(2,120)=2.67, p>.05 TxC: F(2,120)=3.91, p<.05, partial η^2 =.06
Drive for Thinness	22.49 (8.77)	21.49 (7.49)	20.15 (9.63)	T: F(1,118)=11.44, p<.001, partial η^2 =.09
	21.91 (8.73)	19.22 (8.17)	18.69 (8.9)	C: F(2,118)=1.22, p>.05 TxC: F(2,118)=1.35, p>.05
Negative Affect	38.89 (14.36)	40.24 (15.77)	35.03 (16.43)	T: F(1,118)=7.92, p<.01, partial η^2 =.06
	36.20 (13.62)	39.30 (20.13)	29.95 (10.67)	C: F(2,118)=2.69, p>.05 TxC: F(2,118)=1.3, p>.05
Body Dissatisfaction	32.48 (10.62)	31.31 (10.56)	30.83 (10.94)	T: F(1,119)=.42, p>.05
	32.46 (11.69)	30.89 (9.21)	30.30 (10.52)	C: F(2,119)=.39, p>.05 TxC: F(2,119)= 10, p>.05
Internalization-General	28.93 (10.17)	26.92 (8.29)	27.25 (9.13)	T: F(1,120)=2.16, p>.05
	30.74 (12.19)	27.92 (9.25)	26.6 (10.65)	C: F(2,120)=1.11, p>.05 TxC: F(2,120)=2.27, p>.05
Healthy Eating	38.5 (8.0) ₁	40.0 (8.3) ₁	40.48 (7.46) ₁	T: F(1,118)=8.05, p<.01, partial η^2 =.06
	42.17 (8.83) ₂	39.43 (9.37) ₁	41.23 (9.15) ₁	C: F(2,118)=.18, p>.05 TxC: F(2,118)=7.97, p<.001, partial η^2 =.12
Dieting	26.67 (8.95)	25.49 (8.85)	25.41 (9.17)	T: F(1,118)=12.36, p<.001, partial η^2 =.10
	25.71 (10.28)	22.68 (9.67)	23.26 (10.63)	C: F(2,118)=.67, p>.05 TxC: F(2,118)= 97, p>.05
Bulimic Symptoms	15.49 (10.79)	14.22 (9.15)	11.85 (10.25)	T: F(1,119)=2.05, p>.05
	15.27 (9.93)	13.03 (8.15)	11.03 (9.9)	C: F(2,119)=1.88, p>.05 TxC: F(2,119)=0.3, p>.05
Exercise	12.87 (3.86)	12.65 (3.94)	12.15 (4.59)	T: F(1,120)=.89, p>.05
	12.41 (4.03)	12.59 (3.88)	12.05 (4.72)	C: F(2,120)=.24, p>.05 TxC: F(2,120)=.37, p>.05

Note. T: Time main effect; C: Condition main effect; TxC: Time by Condition interaction; Letter subscripts indicate significant differences across conditions; Number subscripts denote significant differences across time.

Mediation Analyses

It was predicted that the effect of the dieting message on weight control intentions and behaviors would be mediated by post-test perceived pressure to lose weight. The Baron and Kenny (1986) procedure for testing mediation was followed, directly comparing the pro-dieting and anti-dieting messages in separate regression analyses for each weight control intention and behavior (i.e., healthy eating, dieting, exercise). Figure 1 depicts the general mediation model. In each model, the direct path from dieting message to the weight control intention/behavior outcome variable was tested (path c). The indirect paths from dieting message to perceived pressure (path a) and perceived pressure to the outcome variable (path b) were then tested. Baseline scores for each outcome variable were used as covariates in all regression analyses (Kenny, 2006). Paths a, b, and c must be significant to meet Baron and Kenny's (1986) preconditions for mediation. If the preconditions were met for a model, then the path coefficient c' was examined after the introduction of perceived pressure into the regression equation. Full mediation occurs when c' is no longer significant after the introduction of the mediating variable. Sobel's test was computed for all models in which there was a reduction in c' to test the significance of the mediation effect.

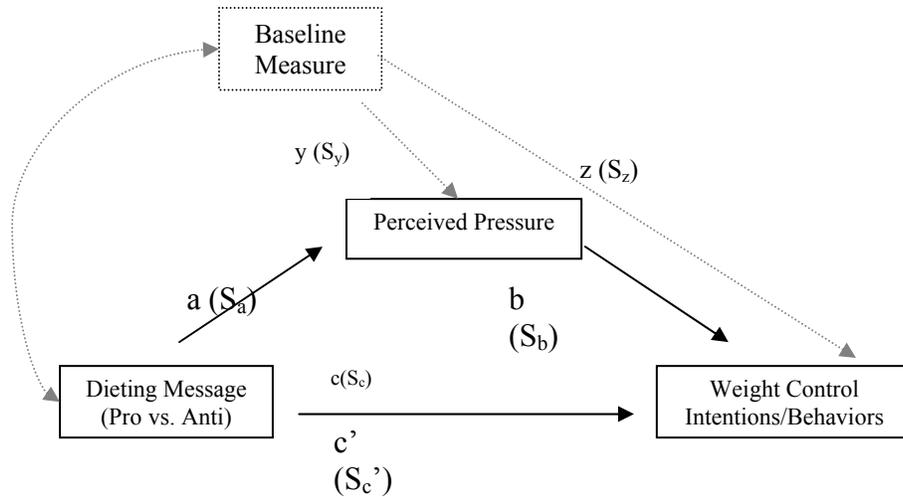


Figure 1. General mediation model.

Table 5 contains the correlation matrix for the variables and conditions (pro-dieting and anti-dieting) examined in the mediation analyses. Baron and Kenny's (1986) preconditions for mediation (significant a, b, and c paths) were met for four out of the five intention variables: dieting intentions, bulimic intentions, internalization intentions, and healthy eating intentions. Only exercise intentions did not meet the preconditions for mediation. Additionally, past two-week healthy eating behaviors assessed at follow-up met the preconditions for mediation; however, no other follow-up behavior met the necessary criteria with path c being non-significant in each case. For each of the five models that met the preconditions, path c' became non-significant when perceived pressure was controlled. The Sobel test was significant for each model, suggesting the presence of full mediation. Table 6 contains the unstandardized path coefficients, standard errors, and Sobel test z-values for each of the five mediated models.

Mediation implies a causal chain with the effects of the independent variable and mediator causing the change in the outcome variable; however, for non-manipulated variables, causality cannot always be assumed (Baron & Kenny, 1986; Shrout & Bolger, 2002). Because the dieting message was experimentally manipulated in this study, causality can be inferred for the dieting message on perceived pressure and weight control intentions and behaviors; however, the mediator and outcome variables were not experimentally manipulated, and the causal relationship between perceived pressures and the outcome variables cannot necessarily be assumed (Shrout & Bolger, 2002). In such cases, Kenny (2006) recommends examining the theoretical plausibility of reverse causality (i.e., the outcome variable causing the mediator) as well as any design considerations that may weaken the possibility of it. If it is plausible that the outcome variable may have caused the mediator, it is often useful to interchange the mediator and outcome variable in the regression equations and compare the paths to the original model (Kenny, 2006). If the b and c' paths are similar to those in the original model, the causal hypothesis cannot be supported.

In the current study, the temporal distance between perceived pressure and past two-week weight control behaviors renders the reverse causality hypothesis impossible for the follow-up healthy eating mediation model. Furthermore, it is unlikely that weight control intentions caused perceived pressure to lose weight from both a theoretical and design standpoint because the former was assessed after the latter; however, because both variables were measured within a short-time span, the mediator and intention variables were interchanged in the regression equations to test the reverse causality hypothesis. All c' paths remained significant in these analyses, providing support for the original

models of mediation and causality hypothesis that perceived pressure mediates the relationship between dieting message and the weight control intentions and behaviors (i.e., dieting intentions, bulimic intentions, internalization intentions, healthy eating intentions, and healthy eating behaviors) rather than the weight control variables mediating the relationship between dieting message and perceived pressure.

Table 5

Correlations among Pre-Test Measures

	PP	DEBQ Intent	EDEQ Intent	SATAQ Intent	MHBI Eating Intent	MHBI Exercise Intent	FU DEBQ	FU EDI-BD	FU EDI-DT	FU SATAQ Pressure	FU SATAQ General	FU SATAQ Athlete	FU EDEQ	FU Eating	FU Exercise	Diet Message Condition
PP	1															
DEBQ Intent	.46**	1														
EDEQ Intent	.40**	.60**	1													
SATAQ Intent	.75**	.44**	.38**	1												
MHBI Eating Intentions	.19	.54**	.26*	.22*	1											
MHBI Exercise Intentions	.27**	.50**	.24*	.37**	.69**	1										
FU DEBQ	.33**	.85**	.62**	.33**	.56**	.44**	1									
FU EDI-BD	.40**	.53**	.41**	.27*	.32**	.32**	.48**	1								
FU EDI-DT	.43**	.77**	.61**	.43**	.51**	.44**	.80**	.61**	1							
FU Pressure	.52**	.43**	.33**	.55**	.22*	.28**	.37**	.40**	.50**	1						
FU SATAQ General Internalization	.42**	.27*	.30**	.57**	.06	.19	.25*	.23*	.39**	.78**	1					
FU SATAQ Athlete Internalization	.34**	.23*	.18	.49**	.11	.31**	.20	.14	.24*	.51**	.63**	1				
FU EDEQ	.38**	.59**	.47**	.39**	.26*	.25*	.61**	.59**	.73**	.43**	.33**	.20	1			
FU MHBI Eating	.20	.44**	.20	.18	.77**	.50**	.53**	.16	.33**	.09	-.04	.13	.10	1		
FU MHBI Exercise	.12	.26*	.09	.22*	.40**	.56**	.34**	.01	.21*	.10	.12	.28**	.05	.46**	1	
Diet Message Cond	.69**	.31**	.20	.51**	.11	.10	.14	.03	.17	.21	.15	.15	.15	.16	.02	1

Note. PP: Post-Test Perceived Pressure; DEBQ: Dutch Eating Behavior Questionnaire-Restraint scale; EDEQ: Eating Disorder Examination Questionnaire-Bulimia subscale; SATAQ: Sociocultural Attitudes Towards Physical Appearance Questionnaire; MHBI: Multidimensional Health Behavior Inventory; FU: Follow-Up; EDI-BD: Eating Disorder Inventory-Body Dissatisfaction subscale; EDI-DT: Eating Disorder Inventory-Drive for Thinness
* p<.05, ** p<.01

Table 6.

Unstandardized Path Coefficients, Standard Errors, and Significance Tests for Mediation Analyses

Path Label	Path Coefficient (Standard Errors)	Dieting Intentions	Bulimic Intentions	Internalization Intentions	Healthy Eating Intentions	Healthy Eating Behaviors at Follow-Up
Dieting Message to Perceived Pressure	a (S _a)	6.07 (.77)*	6.04 (.73)*	5.87 (.71)*	6.12 (.80)*	6.12 (.80)*
Perceived Pressure to Weight Control Intentions/Behavior	b (S _b)	.66 (.18)*	.23 (.09)*	.64 (.11)*	.54 (.19)*	.36 (.16)*
Dieting Message to Weight Control Intentions/Behavior	c (S _c)	6.67 (1.31)*	1.26 (.59)*	4.37 (.82)*	3.05 (1.41)*	4.13 (1.15)*
Dieting Message to Weight Control Intentions/Behaviors (controlling for path b)	c' (S _{c'})	2.64 (1.62)	-.12 (.78)	.61 (.93)	-.29 (1.78)	1.93 (1.48)
Baseline variable to Perceived Pressure	y (S _y)	.09 (.04)*	.14 (.04)*	.17 (.04)*	-.02 (.05)	-.02 (.05)
Baseline variable to Weight Control Intentions/Behaviors	z (S _z)	1.07 (.07)*	.12 (.03)*	.24 (.04)*	.87 (.09)*	.92 (.07)*
Correlation between Baseline Variable and Diet Message		.08	.07	.11	-.08	-.09
Sobel Test (z-value)		3.32*	2.43*	4.75*	2.66*	2.16*

Note. Baseline trait variables were controlled in each model.

* p<.05

Exploratory Analyses

Exploratory moderator analyses. Trait level thin-ideal internalization was explored as a possible moderator of outcome based on previous research supporting its causal risk factor status for eating pathology (Stice, 2002; Thompson & Stice, 2001). Following the procedures of Baron and Kenny (1986), baseline levels of the SATAQ-3 General Internalization subscale was tested as a moderator of post-test perceived pressure and weight control intentions and behaviors. Figure 2 illustrates the general moderation model. Accordingly, regression analyses evaluated the diet message as a predictor (path

a), pre-test thin-ideal internalization as a moderator (path b), and the interaction of the product of the predictor and the moderator (path c). Baseline scores for the outcome variable were entered as covariates (paths w, x, y, z). The moderator hypothesis is supported when the interaction term (path c) is significant (Baron & Kenny, 1986).

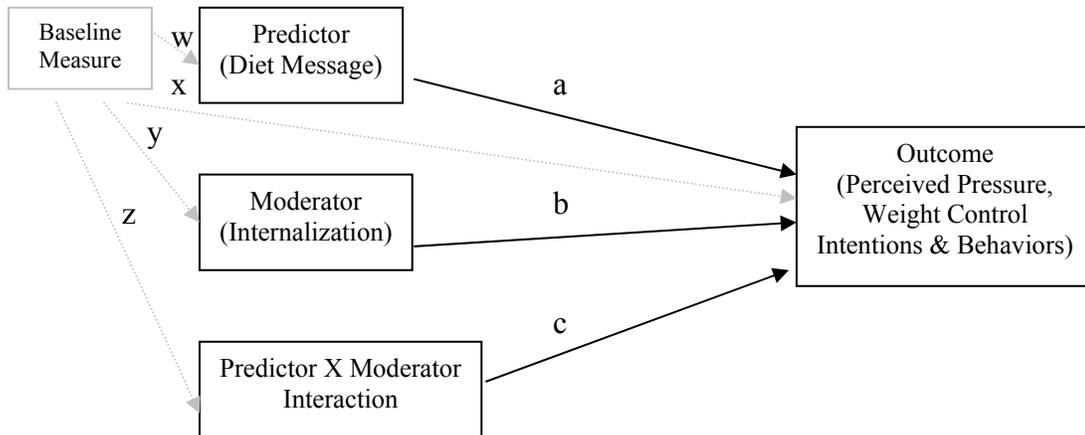


Figure 2. General moderation model.

Initial considerations for the moderator analyses include examining the temporal relationship of the variables as well as establishing independence of the predictor and mediator variables. The SATAQ-3 Internalization subscale is a trait measure that was measured at baseline prior to the experimental manipulation, which is ideal in moderator analyses (Kenny, 2006; Kraemer et al., 2002). Because the predictor (diet message) is randomized, there should be no relationship between the predictor and the mediator (internalization). The point-biserial correlation between these two variables ($r_{pb} = .1, p > .05$) confirms that the predictor and moderator are indeed independent. Correlations between the hypothesized moderator and the outcome variables should also be ideally

uncorrelated to provide a “clearly interpretable interaction term” (Baron & Kenny, 1986, p.1174); however, as Table 7 illustrates, the SATAQ-3 trait internalization measure was significantly correlated with all of the outcome variables except follow-up healthy eating behaviors (r’s ranging from .14 - .87). Although it is *desirable* that the moderator and outcome variables be uncorrelated, Baron and Kenny (1986) do not state that it is prerequisite that they be uncorrelated in order to conduct the moderator analyses. Therefore, it appeared to be appropriate to proceed with the analyses.

Table 7.

Correlations Among Trait Internalization, Diet Message, and Outcome Variables

	SATAQ-3 General Internalization
Diet Message (pro vs. anti)	.10
Post-Test Perceived Pressure	.30**
DEBQ Intentions	.32**
EDEQ Intentions	.28**
Internalization Intentions	.38**
MHBI Eating Intentions	.19*
MHBI Exercise Intentions	.20*
Follow-Up EDI-BD	.36**
Follow-Up EDI-DT	.39**
Follow-Up SATAQ Pressures	.70**
Follow-Up SATAQ Internalization	.87**
Follow-Up EDEQ	.35**
Follow-Up MHBI Eating	.14
Follow-Up MHBI Exercise	.18*
FU PANAS	.25**

Note. DEBQ: Dutch Eating Behavior Questionnaire-Restraint scale; EDEQ: Eating Disorder Examination Questionnaire-Bulimia subscale; SATAQ: Sociocultural Attitudes Towards Physical Appearance Questionnaire; MHBI: Multidimensional Health Behavior Inventory; EDI-BD: Eating Disorder Inventory-Body Dissatisfaction subscale; EDI-DT: Eating Disorder Inventory-Drive for Thinness; PANAS: Positive and Negative Affect Scale

*p<.05

**p<.01

Separate regression equations were computed using the baseline measure as a covariate for each exploratory model. As Table 8 illustrates, the moderator hypothesis

was supported for two of them: post-test perceived pressure and internalization intentions. For the post-test pressure model, the interaction term (path c) was significant, standardized $\beta = .64$, $p < .01$, when controlling baseline SATAQ-3 Pressures, diet message, and baseline SATAQ-3 General Internalization. The R^2 significantly increased from .21 with only the covariate entered into the regression to .62 for the entire model. Additionally, the interaction term (path c) for the internalization intentions model was significant, standardized $\beta = .75$, $p < .01$, when the predictor and moderator were controlled. The R^2 for the entire model was .51. All remaining models resulted in non-significant interaction terms. Therefore, the findings suggest that trait thin-ideal internalization moderated the relationship between diet message and post-test perceived pressure to lose weight as well as diet message and post-test internalization intentions.

Table 8.

Standardized Beta Weights and R² Values for Moderator Analyses

	Baseline Variable	Diet Message	Baseline Internalization	Interaction	R ²
Post-Test Pressure	.3**	.01	.05	.64**	.62
Internalization Intentions	N/A	-.26	.39**	.75**	.51
Dieting Intentions	.8**	.31	.22**	-.06	.80
Bulimic Intentions	.39**	.41	.13	-.23	.24
Exercise Intentions	.49**	-.38	.13	.42	.33
Healthy Eating Intentions	.74**	-.1	.02	.28	.57
Healthy Eating Behavior	.83**	.28	-.02	-.05	.70
Exercise Behavior	.78**	-.09	.02	.04	.62
Dieting Behavior	.80**	.32	.18*	-.26	.68
Bulimic Behavior	.80**	.23	.06	-.17	.65

Note.

* $p < .05$

** $p < .01$

Exploratory weight status analyses. Exploratory analyses were also conducted to examine the effects of participant weight status by condition on the non-specific perceptions of the psychoeducational messages (MRF items), post-test perceived pressure and behavioral intentions, and pre-test to follow-up change in psychological functioning and weight control behaviors. The participant weight status variable was developed using self-reported BMI and collapsing participants into either Not Overweight (BMI < 25) or Overweight (BMI ≥ 25). 69.1% ($N = 85$) of participants were categorized as Not Overweight while 30.9% ($N = 38$) fell into the Overweight category. Cell sizes, denoted as Not Overweight (N_1) and Overweight participants (N_2), were as follows: Pro-dieting condition ($N_1 = 32, N_2 = 14$), Anti-dieting condition ($N_1 = 27, N_2 = 10$), and No-dieting condition ($N_1 = 25, N_2 = 13$). All exploratory analyses were identical to those conducted in the planned analyses section with weight status (Not Overweight/Overweight) added as a between subjects factor.

On the MRF items, a significant condition by weight status interaction was found for the MRF applicable item, $F(2, 123) = 3.43, p < .05$, partial $\eta^2 = .06$. Post-hoc tests revealed that overweight participants in the pro-dieting condition found the message significantly more applicable to them ($M = 4.43$) than did those who were not overweight ($M = 2.75$); no differences in applicability of the message by weight status were found for the anti-dieting or no-dieting conditions. There was a marginally significant condition by weight status interaction for the MRF influential item, $F(2, 123) = 2.9, p = .06$, partial $\eta^2 = .05$. The mean trends suggest that overweight participants in both the pro-dieting and anti-dieting message conditions found the messages more influential than non-overweight participants (Pro-dieting: $M_o = 3.93, M_{no} = 2.78$; Anti-dieting: $M_o = 2.96, M_{no} = 3.5$). A

main effect for weight status was found on the MRF credible item, $F(1, 123) = 4.68$, $p < .05$, partial $\eta^2 = .04$, with overweight participants finding the messages more credible ($M = 3.91$) than the not overweight participants ($M = 3.48$); the main effect for condition and the weight status by condition interaction were not significant for the credible item. There was a marginally significant main effect for weight status on the convincing item, $F(1, 123) = 3.51$, $p = .06$, with non-significant mean trends suggesting that overweight participants ($M = 4.21$) found the messages more convincing than non-overweight participants ($M = 3.86$). The main effect for condition and the condition by weight status interaction were non-significant for the MRF convincing item. There were no significant main effects or interactions for the MRF effective or easy to understand items.

For the post-test perceived pressure scale, the ANCOVA revealed a significant condition by weight status interaction, $F(2, 123) = 11.14$, $p < .0001$, partial $\eta^2 = .16$. Figure 3 illustrates the covariate adjusted mean values by condition and weight status. Post-hoc tests indicated that overweight participants in the pro-dieting condition perceived greater pressure to lose weight at post-test (adjusted $M = 15.29$) than the non-overweight participants in the same condition (adjusted $M = 10.87$). Furthermore, non-overweight participants in the pro-dieting condition perceived significantly greater pressure to lose weight than both overweight and non-overweight participants in the other two conditions.

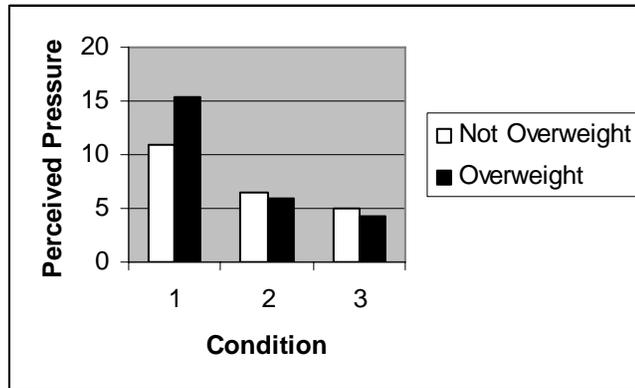


Figure 3. Covariate adjusted means for perceived pressure.

ANCOVA analyses on the state measures revealed a significant condition by weight status interaction for post-test state body dissatisfaction, $F(2, 122) = 4.12, p < .05$, partial $\eta^2 = .07$. As Figure 4 illustrates, overweight individuals reported higher state body dissatisfaction in the pro-dieting condition (adjusted $M = 109.15$) than not overweight participants in that condition (adjusted $M = 86.92$). There were no significant differences in post-test state body dissatisfaction between overweight and non-overweight individuals in the anti-dieting and no-dieting conditions. Additionally, state body dissatisfaction for overweight participants in the pro-dieting condition was significantly higher than for the overweight individuals in the no-dieting condition (adjusted $M = 71.55$); however, there was not a significant difference in state body dissatisfaction for overweight individuals when comparing the pro-dieting versus the anti-dieting or the anti-dieting versus the no-dieting conditions. There were no differences in state body dissatisfaction for non-overweight participants among the conditions.

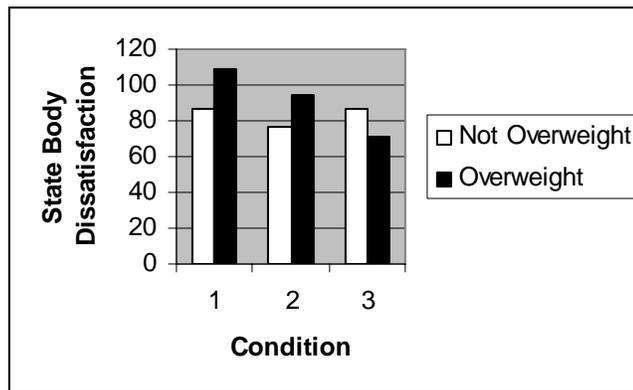


Figure 4. Covariate adjusted means for state body dissatisfaction.

The ANCOVA for state negative affect yielded a marginally significant main effect for condition, $F(2, 121) = 3.02$, $p = .05$, partial $\eta^2 = .05$. Mean trends suggest that the pro-dieting message (adjusted $M = 33.25$) elicited greater negative affect at post-test than the anti-dieting message (adjusted $M = 30.71$) and the no-dieting message (adjusted $M = 31.19$). The main effect for weight status and the condition by weight status interaction were non-significant.

For the post-test weight control intention variables, a significant main effect for weight status was found for healthy eating intentions, $F(1, 122) = 6.67$, $p < .01$, partial $\eta^2 = .06$, with overweight participants reporting greater healthy eating intentions (adjusted $M = 48.71$) than non-overweight individuals (adjusted $M = 45.51$). Consistent with the main analyses, the main effect for condition as well as the condition by weight status interaction was non-significant for healthy eating intentions. A significant main effect for weight status was also found for exercise intentions, $F(1, 123) = 12.71$, $p < .001$, partial $\eta^2 = .10$. Overweight individuals (adjusted $M = 16.52$) reported significantly

greater exercise intentions than those who were not overweight (adjusted $M = 14.34$). Consistent with the main analyses, the condition main effect remained non-significant for exercise intentions, and the condition by weight status interaction was non-significant. For bulimic intentions, the main effect for condition remained significant, $F(2, 122) = 3.48$, $p < .05$, partial $\eta^2 = .06$; however, post-hoc tests revealed a different mean trend when weight status was added as a between subjects factor. The pro-dieting condition (adjusted $M = 9.05$) yielded greater bulimic intentions than the anti-dieting condition (adjusted $M = 7.48$), but no other post-hoc differences were found.¹ No new findings were found when adding weight status as a between-subjects factor for internalization intentions or dieting intentions. The main effects for condition remained significant in the same directions reported in the main study analyses.

For healthy eating behaviors, the time, $F(1, 115) = 11.71$, $p < .001$, partial $\eta^2 = .09$, and time by condition, $F(2, 115) = 8.7$, $p < .001$, partial $\eta^2 = .13$, effects remained significant in the directions reported in the main study analyses. A significant time by weight status interaction was also found for healthy eating behaviors, $F(1, 115) = 4.26$, $p < .05$, partial $\eta^2 = .04$. Post-hoc tests revealed significant increases in healthy eating across time in overweight individuals ($M_1 = 40.22$; $M_2 = 42.75$) with no change in the healthy eating behaviors of non-overweight participants ($M_1 = 39.56$; $M_2 = 40.07$). The time by condition by weight status interaction for healthy eating was non-significant. No new findings were yielded in the repeated measures ANOVAs when adding weight status as a between subjects factor for exercise behaviors, dieting, bulimic symptoms or any of

¹ In the main study analyses, the no-dieting condition reported significantly greater bulimic intentions than the anti-dieting condition; however, the pro-dieting condition was not significantly different from either of the other conditions.

the psychological functioning variables: negative affect, body dissatisfaction, drive for thinness, perceived pressure, and thin-ideal internalization (general or athlete).

Chapter 4

Discussion

The purpose of the current study was to examine the immediate and short-term effects of dieting-related psychoeducational messages on psychological functioning and weight control intentions and behaviors. It was hypothesized that the pro-dieting message would produce greater post-test perceived pressure to lose weight and weight control intentions and behaviors as well as greater state body dissatisfaction than the anti-dieting and no-dieting message conditions. It was also hypothesized that post-test perceived pressure to be thin would mediate the relationship between dieting message and weight control intentions and behaviors. The experimental nature of the current study also allowed for the examination of the risk factor status of the perceived pressure construct. Specifically, it was hypothesized that perceived pressure would meet Kraemer et al.'s (1997) criteria as a causal risk factor for bulimic symptomatology. Exploratory analyses were also conducted in order to examine the role of participant weight status on the outcome variables as well as to assess the extent to which trait thin-ideal internalization moderated the findings.

Several of the hypotheses were fully or partially supported. A large effect size (partial $\eta^2 = .57$) was found for post-test differences in perceived pressure. Differences were in the predicted direction with the pro-dieting message yielding greater post-test perceived pressure than the anti-dieting message, which was greater than the no-dieting

message. This finding replicates the pilot study, and taken together, the results from the two studies suggest a robust difference among the dieting messages on post-test perceived pressure to lose weight. Furthermore, the current study found that the pro-dieting message elicited greater dieting and internalization intentions at post-test than the anti-dieting and no-dieting message conditions. Bulimic intentions were significantly lower in the anti-dieting, eating disorder prevention message than the other two conditions. The hypotheses were not supported, however, for post-test differences for the variables of healthy eating and exercise intentions or state body dissatisfaction.

The primary findings from the repeated measures analyses suggest there were significant increases in healthy eating behaviors from baseline to follow-up in the pro-dieting condition but no changes in the other two conditions. Perceived pressure decreased significantly from baseline to follow-up in the anti-dieting and no-dieting conditions with no changes in the pro-dieting condition. Similarly, internalization-athlete scores decreased significantly in the no-dieting condition and decreased marginally in the anti-dieting condition while there were no changes in the pro-dieting condition. There were decreases from baseline to follow-up in drive for thinness, negative affect, and dieting in all conditions. No changes were found for body dissatisfaction, general thin-ideal internalization, bulimic symptoms, or exercise behavior.

The two active, dieting-related psychoeducational messages were directly compared in mediator and moderator analyses, and the hypotheses were partially supported. Post-test perceived pressure was found to fully mediate the relationship between the diet message (pro vs. anti) and dieting intentions, bulimic intentions, internalization intentions, healthy eating intentions, and follow-up healthy eating

behaviors. The plausibility of reverse causation was examined and does not appear to account for the significant findings. The mediator hypotheses were not supported for exercise intentions, bulimic behaviors, dieting behaviors, or exercise behaviors.

Exploratory moderational analyses were also conducted using trait level of thin-ideal internalization as a potential moderator of post-test perceived pressure and weight control intentions and behaviors. Thin-ideal internalization was found to moderate post-test perceived pressure and internalization intentions. No other weight control intentions or behaviors were found to be moderated by baseline internalization levels.

Weight status of the participant was also examined as a between subjects factor in exploratory analyses that are intriguing, yet limited due to small sample sizes within each cell. Overweight participants in the pro-dieting condition rated the psychoeducational message as more applicable to themselves than non-overweight individuals in the same condition. Similarly, a marginally significant interaction trend suggests that overweight individuals in the pro-dieting and anti-dieting conditions perceived the psychoeducational message as more influential to them than those who were not overweight. Main effects for weight status suggest the messages were perceived as more credible and convincing in overweight compared to non-overweight participants.

Exploratory analyses also revealed important differences among the conditions by weight status on several post-test and follow-up variables. A significant weight status by condition interaction revealed overweight participants in the pro-dieting condition perceived the most pressure to lose weight at post-test. Interestingly, non-overweight participants in the pro-dieting condition reported significantly greater perceived pressure than both overweight and non-overweight individuals in the other two conditions.

Similarly, those who were overweight in the pro-dieting condition reported significantly greater state body dissatisfaction at post-test than non-overweight individuals in the same condition; they also were more dissatisfied at post-test than overweight individuals in the no-dieting, control condition. Significant main effects for weight status revealed that overweight individuals reported significantly greater healthy eating and exercise intentions than those who were not overweight. Additionally, significant increases in healthy eating behavior were found in overweight compared to non-overweight participants.

A final goal of the study was to evaluate the risk factor status of the perceived pressure construct according to Kraemer et al.'s (1997) criteria. Previous research has identified perceived pressure as a risk factor for eating pathology in women; however, experimental research is necessary to determine whether the construct meets Kraemer et al.'s (1997) definition of a causal risk factor. The current study found significant differences among the three diet message conditions on perceived pressure at post-test, allowing for the interpretation of the construct's effect on bulimic symptomatology. Significant differences in bulimic intentions were found at post-test; however, the main study analyses did not find higher bulimic intentions in the pro-dieting (greater perceived pressure) condition as hypothesized. Rather, the anti-dieting (decreased pressure) condition resulted in lower bulimic intentions compared to the pro-dieting and no-dieting conditions; however, the exploratory analyses, which included participant weight status as a between-subjects factor, did find greater bulimic intentions in the pro-dieting condition than the anti-dieting as predicted. The mediational analyses found that post-test perceived pressure fully mediated the relationship between the diet message (pro vs. anti)

and bulimic intentions. There was not, however, a significant increase in bulimic symptomatology across time in the pro-dieting condition as hypothesized. Collectively, these findings provide some evidence that perceived pressure plays a substantive role in bulimic symptomatology, but they do not provide direct support for the causal risk factor hypothesis. Because of these mixed findings, more experimental research must be conducted to further evaluate the perceived pressure construct on eating pathology.

It is instructive to interpret the findings based on the effectiveness of the overall goals of the two dieting messages. The pro-dieting message is aimed towards preventing obesity, and the overall goals are to increase caloric restriction, exercise, and healthy eating behaviors for the purposes of weight loss and/or maintaining an average body weight. From this perspective, the findings from the current study are encouraging. Dieting intentions were significantly higher in the pro-dieting message condition compared to the other two conditions. Healthy eating increased from baseline to follow-up in those who were in the pro-dieting condition while there were no significant increases in bulimic symptomatology. This finding provides further evidence for a mounting body of research that is calling into question the widely held belief that dietary restriction is associated with growth in bulimic symptomatology (e.g., Presnell & Stice, 2003; Stice et al., 2005).

There is additional evidence that the pro-dieting message had particularly strong effects on overweight and obese individuals, which could also be interpreted as encouraging, given that the message is targeted towards this population. The pro-dieting message was perceived as more influential and applicable to themselves by overweight participants. Additionally, overweight participants reported significantly greater

perceived pressure and state body dissatisfaction at post-test. While this finding could be viewed negatively because perceived pressure and body dissatisfaction have been found to be risk factors for eating pathology (Stice, 2002), there is some evidence that moderate body dissatisfaction may be a motivator for increasing healthy lifestyle behaviors (Heinberg, Thompson, & Matzon, 2001). It is also possible that perceived pressure could be an impetus for positive behavioral change. Findings from the current study provide mixed results for this hypothesis. On the one hand, it is promising that perceived pressure was found to fully mediate the relationship between diet message (pro vs. anti) and dieting intentions, healthy eating intentions, and healthy eating behaviors in the current study; however, perceived pressure also fully mediated the relationship between diet message and bulimic intentions, suggesting that it is also related to unhealthy weight control practices.

The findings of the study can also be interpreted from an eating disorder prevention perspective. The anti-dieting, eating disorder prevention message aims to reduce dysfunctional eating patterns, including strict dieting, improve body image attitudes, and increase healthy weight control practices. The anti-dieting message was successful at producing significantly lower post-test bulimic intentions and dieting intentions than the other two conditions. Furthermore, post-test perceived pressure and internalization intentions were significantly lower in the anti-dieting condition compared to the pro-dieting group. At follow-up, those in the anti-dieting condition reported reduced levels of perceived pressure and athlete-internalization; however, this reduction was also found in the no-dieting condition. The anti-dieting message was not successful

at producing lower state body dissatisfaction levels. Furthermore, no behavioral changes were found from baseline to follow-up in the anti-dieting message condition.

From the eating disorder prevention perspective, it is alarming that the pro-dieting message elicited greater levels of established risk factors (perceived pressure, dieting and internalization intentions) for eating pathology at post-test. Particularly concerning are the high levels of perceived pressure to lose weight, even in participants who were not overweight. Given the recent widespread dissemination of this message in the media, it is unclear what the cumulative effect of this message may be on psychological functioning and weight control practices.

Although the results of the study are intriguing, there are several limitations that warrant discussion. The sample size for the study was somewhat small, and power to detect interaction effects may have been compromised, particularly in the exploratory analyses. Statistical power was also reduced in the mediator and moderator analyses because a third of the sample (no-dieting condition) was excluded, and Type II errors may have occurred.

The sample used in the study also has some limitations. Only undergraduate females were included in the study, which limits the generalizability of the findings to other populations. Future research should replicate the study in samples that include males, older individuals, and non-college students. Furthermore, while the ethnic composition of the sample was fairly diverse, it is possible that the diet messages have differential effects by race. The current study did not have adequate power to examine these potential differences, and future research should ensure adequate numbers of ethnic minorities to examine this question. Lastly, to minimize any potential risks associated

with the study, individuals with a past history of an eating disorder or current purging behaviors were excluded from the study, which may have restricted the range of the sample at the disordered eating end of the spectrum while the range was not restricted on the overweight/obesity side. It is unknown how many individuals were excluded based on these criteria because it was done automatically through the online participant pool filtering system; however, it is possible that this restriction of range may have affected the results by potentially reducing any deleterious effects of the messages on more eating disturbed individuals. Future research should include more disturbed samples on both the eating disorder and obesity ends of the spectrum.

The study also relied solely on self-report measures of behavior. This is problematic because it is unclear how actual behavior overlaps with self-reported behavior on several of the measures, particularly with respect to eating behavior. It is widely accepted that people tend to underreport the amount of food they consume because of poor accuracy of food quantity and caloric value, cognitive processing errors, and social desirability (Klesges, Eck, & Ray, 1995; Mulheim, Allison, Heshka, & Heymsfield, 1998; Smith, Jobe, & Mingay, 1991; Zegman, 1984). Although caloric intake was not directly assessed in this study, participants did self-report on frequency of healthy eating, dietary restriction, exercise, and bulimic symptoms, which are also likely plagued by similar limitations. Future research may consider using diary methods as well as including a social desirability scale to more accurately assess actual behavioral change.

The follow-up period for the study was also brief, and it is unclear whether differences observed at the two-week follow-up would be sustained over a longer time interval. Additionally, the psychoeducational messages were created to be very brief in

an effort to maintain external validity by closely replicating patient education brochures or newspaper articles; however, it is unclear whether the length of the materials would differentially affect the results. Moreover, participants were only exposed to the experimental message once. Future research should study the dose effects of the messages to assess their cumulative effects on psychological functioning and weight control practices, which is of particular importance for the pro-dieting message given its widespread dissemination to the public.

Future research may also consider examining the effects of tailoring the dieting messages based on individual difference variables (Kreuter, Oswald, Bull, & Clark, 2000). For example, the current study found that trait levels of thin-ideal internalization moderated the extent to which the participant perceived pressure from the dieting message. This finding could suggest that individuals with high levels of trait internalization may benefit more from the anti-dieting message while those with low levels may benefit more from the pro-dieting message. Demographic variables such as race, sex, weight status, and age as well as dieting history and trait body dissatisfaction may be other individual difference variables that could be explored in future research on tailored messages. Another potential avenue for future research is to examine the psychological and behavioral effects of these messages when they are delivered in-vivo by a physician, dietician, or other health professional.

In efforts towards bridging the fields of obesity and eating disorder prevention, future research from both perspectives should assess healthy weight control practices as well as disordered eating risk factors and behaviors to better understand the interplay of these constructs. Ultimately, these two fields share similar goals of promoting health and

wellness through diet and exercise to reduce the likelihood of physical and mental disorders. Developing a more unified approach to psychoeducation and prevention will likely benefit all by resulting in a more cost-effective and straightforward program for the consumer as well as greater potential for the reduction of eating and weight-related disorders.

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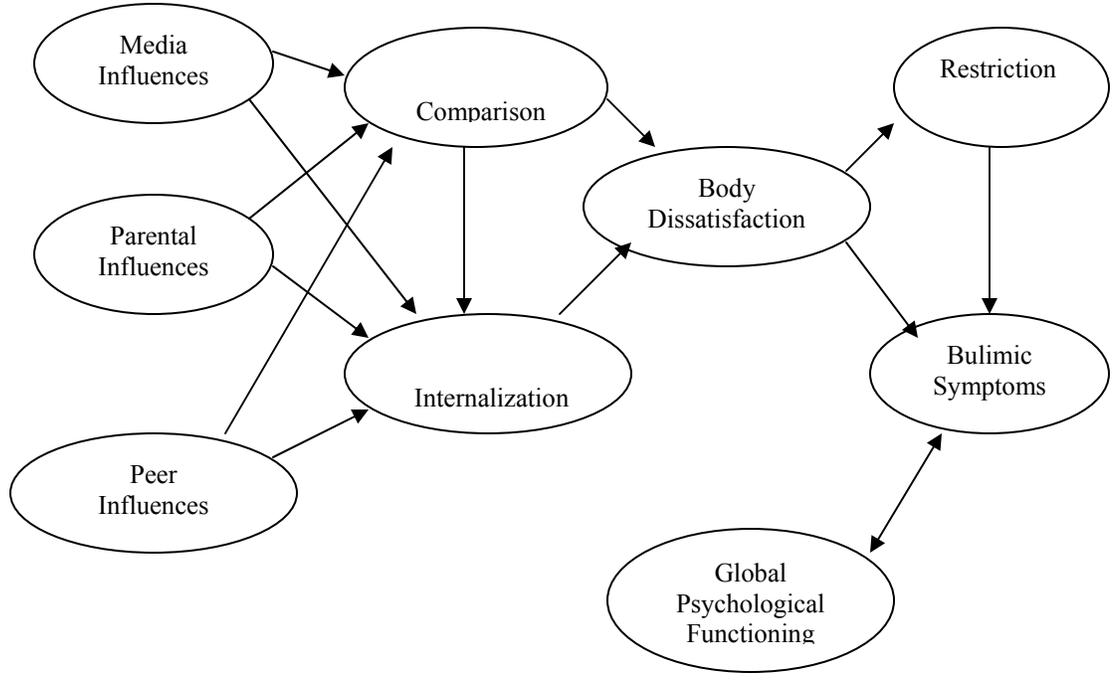
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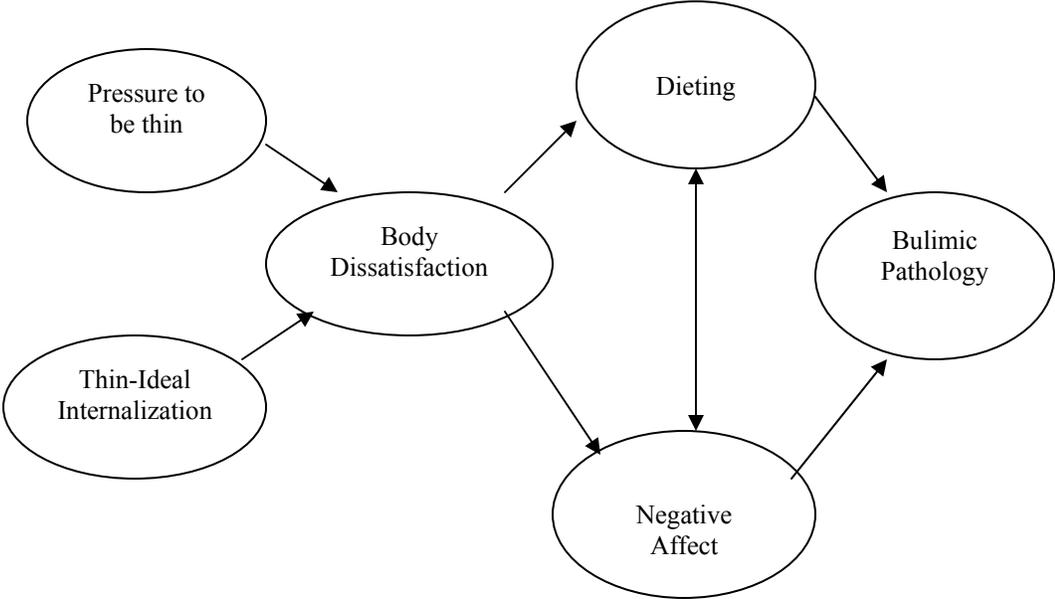
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Appendices

Appendix A: The Tripartite Model of Influence



Appendix B: The Dual-Pathway Model of Bulimic Pathology



Appendix C: Obesity Prevention Message

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES CALLS FOR HEALTH PROMOTION

LOSE WEIGHT AND/OR MAINTAIN A LOW BODY WEIGHT TO PREVENT OVERWEIGHT AND OBESITY

The rates of overweight and obesity in the United States have reached epidemic proportions. According to Tommy G. Thompson, Secretary of the U.S. Department of Health and Human Services, "Overweight and obesity are among the most pressing new health challenges we face today." In 1999, 61% of adults in the United States were overweight or obese. 13% of children aged 6 to 11 and 14% of adolescents aged 12 to 19 were overweight. Obesity among adults has doubled since 1980, while overweight among adolescents has tripled. The U.S. Surgeon General, David Satcher, has stated, "Overweight and obesity may soon cause as much preventable disease and death as cigarette smoking."

What is Overweight and Obesity?

The National Institutes of Health define obesity and overweight using a Body Mass Index (BMI), which is a measure of weight in relation to height. It can be calculated using the formula of $((\text{weight in pounds}/\text{height in inches}^2) \times 703)$. An overweight adult has a BMI between 25 and 29.9, while an obese adult has a BMI of 30 or above.

Causes of Overweight and Obesity

Overweight and obesity can be contributed to an imbalance between caloric intake and calories used throughout the day. Two common reasons for being overweight are eating too much and not being physically active enough. When individuals eat more calories than the body burns up, the extra calories are stored as fat. Excess fat results in overweight or obesity.

Consequences of Overweight and Obesity

Overweight and obesity are serious problems, and there are many health consequences that are attributable to them. Approximately 300,000 U.S. deaths per year currently are associated with obesity and overweight; this is compared with approximately 400,000 U.S. deaths per year that are associated with cigarette smoking. Overweight and obesity have been linked with heart disease, certain types of cancer, type 2 diabetes, stroke, arthritis, breathing problems such as asthma and sleep apnea. Additionally, overweight and obesity are associated with increased risks of gall bladder disease, incontinence, increased surgical risk, and reproductive problems.

Overweight and obesity also have several psychological consequences, including an increased risk for depression. Quality of life is also frequently affected by overweight and obesity due to limited mobility and decreased physical endurance. Social, academic, and job discrimination has also been associated with obesity.

What You Can Do to Prevent Overweight and Obesity

If you are overweight or obese, lose weight! Weight loss, as modest as 5-15% of overweight or obese person's body weight, reduces the risk factors for some diseases, particularly heart disease. Weight loss can also result in lowered blood pressure, lowered blood sugar, and improved cholesterol levels.

Maintain a low body weight if you are currently not overweight or obese. To maintain your weight, your intake of calories must equal your energy output. A difference of one extra 12-oz soda (150 calories) can add 10 pounds to your weight each year, so it is important to maintain a balance between caloric intake and energy output even if you are not currently overweight or obese.

Appendix C (Continued)

Other good habits for health that will help prevent overweight and obesity are:

- Recognize that although genetics do play a role in body size and shape, your habits largely impact your weight and are important in the prevention of overweight and obesity.
- Consult a body mass index chart to determine your ideal weight.
- Make physical fitness a priority! It is recommended that Americans accumulate at least 30 minutes of moderate physical activity most days of the week. More may be needed to prevent weight gain, to lose weight, or to maintain weight loss.
- Eat well by choosing lower fat, lower calorie foods to attain or maintain a low body weight. Prepare food by broiling or baking more often than frying. Eat lean meat, fish, and poultry without skin.
- Eat more fruits, vegetables, and whole grains.
- Reduce your caloric intake by limiting your portion sizes and avoid going back for seconds.

Appendix D: Eating Disorder Prevention Message

THE NATIONAL EATING DISORDER ASSOCIATION CALLS FOR HEALTH PROMOTION

STOP DIETING AND ACCEPT ALL BODY SIZES TO PREVENT DISORDERED EATING

In the United States, conservative estimates indicate that 5-10% of girls and women (that translates into 5-10 million girls and women) and 1 million boys and men are struggling with eating disorders including anorexia, bulimia, binge eating disorder, or borderline conditions. In addition to full-blown eating disorders, many individuals struggle with body dissatisfaction and sub-clinical disordered eating attitudes and behaviors. Studies suggest that approximately 80% of American women are dissatisfied with their appearance. It is estimated that 40-50% of American women are trying to lose weight at any point in time. In fact, Americans spend more than \$40 billion dollars per year on dieting and diet-related products. That's roughly the equivalent the U.S. government spends on education each year.

What is Disordered Eating?

The symptoms of disordered eating such as restricting food intake, compulsively exercising, overeating, purging, and dissatisfaction with body weight and shape are often considered "normal" and harmless in our culture. Many people who engage in these behaviors may not feel that they have a problem. However, these habits are problematic and unhealthy.

Causes of Disordered Eating

Disordered eating arises from a complex combination of behavioral, emotional, psychological, interpersonal, and social factors. Cultural pressures that glorify thinness and place value on obtaining a low body weight have also been implicated as reasons for the development of disordered eating.

Consequences of Disordered Eating

Disordered eating is a serious problem, and there are many health consequences associated with it. Chronic dieting can deprive you of essential nutrients such as calcium, and repetitive cycles of gaining, losing, and regaining weight has been shown to have negative health effects, including increased risk of heart disease and long-lasting negative impact on metabolism. Disordered eating has also been associated with osteoporosis, dehydration, fatigue, dry skin and hair, muscle loss, electrolyte imbalances, loss of coordination, tooth decay, peptic ulcers and pancreatitis, and even death in severe cases.

Disordered eating also has several psychological consequences. Research has shown that disordered eating is associated with feelings of depression, low self-esteem, increased stress, and problems with memory and concentration.

What You Can Do to Prevent Disordered Eating

Stop dieting! Dieting is rarely effective and can lead to disordered eating. 95% of all dieters regain their lost weight and more within 1 to 5 years. Additionally, many studies and health professionals note that patients with eating disorders were dieting at the time of the onset of their eating disorder. While dieting may not cause an eating disorder, the constant concern about body weight and shape, fat grams, and calories can start a vicious cycle of body dissatisfaction and obsession that can spiral into disordered eating all too quickly.

Other good habits that will help prevent disordered eating are:

- Recognize that every body is different and that genetics strongly influence bone structure, body size, shape, and weight differently.
- Understand that there is no ideal body size, shape, or weight that every individual should strive to achieve. Don't rely on charts, formulas, and tables to dictate what's right for you.
- Exercise moderately by engaging in physical activity that you enjoy.
- Enjoy your favorite meal without feelings of guilt or anxiety over calories.
- Fuel your body with a variety of foods.
- Listen to your body. Eat exactly what appeals to you when you are truly hungry. Stop when you are full.

Appendix E: Flu Prevention Message

CENTERS FOR DISEASE CONTROL AND PREVENTION CALLS FOR HEALTH PROMOTION

GET VACCINATED TO PREVENT THE FLU

Infection with influenza viruses can result in illness ranging from mild to severe with life-threatening complications such as pneumonia. An estimated 10% to 20% of U.S. residents get the flu each year. An average of 114,000 people are hospitalized for flu-related complications and 36,000 Americans die each year from complications of flu.

What is Influenza?

Influenza (commonly called “the flu”) is a contagious respiratory illness caused by influenza viruses. It attacks the respiratory tract in humans (nose, throat, and lungs) and is different from a cold. Influenza usually comes on suddenly and may include these symptoms: fever, headache, tiredness, dry cough, sore throat, nasal congestion, and body aches. Gastro-intestinal symptoms such as nausea, vomiting, and diarrhea are much more common in children than adults.

Spread of the Flu

The main way that influenza viruses are spread is from person to person in respiratory droplets of coughs and sneezes. This is called droplet spread. This can happen when droplets from a cough or sneeze or an infected person are propelled (generally up to 3 feet) through the air and deposited in the mouth or nose of people nearby. Though much less frequent, the viruses can also be spread when a person touches respiratory droplets on another person or object and then touches their own mouth or nose (or someone else’s mouth or nose) before washing their hands.

Scientific studies show that adults can shed the virus from 1 day before developing symptoms to up to 7 days after getting sick. Young children can shed the virus for longer than seven days. In general, however, more virus is shed earlier in the illness than later.

Consequences of Influenza

Most people who get the flu will recover in one to two weeks, but some people will develop life-threatening complications as a result of the flu. Anyone can get the flu, and serious problems from influenza can happen at any age. People age 65 years and older, people of any age with chronic medical conditions, and very young children are more likely to get complications from influenza. Pneumonia, bronchitis, and sinus and ear infections are three examples of complications from influenza. The flu can make chronic health problems worse. For example, people with asthma may experience asthma attacks while they have the flu.

What You Can Do to Prevent Influenza

The single best way to prevent the flu is to get vaccinated each fall. In the absence of a vaccine, however, there are other ways to protect against flu. Three antiviral drugs (amantadine, rimantadine, and oseltamivir) are approved and commercially available for use in preventing flu. All of these medications are prescription drugs, and a doctor should be consulted before the drugs are used for preventing the flu.

Appendix E (Continued)

Other good habits for health that may prevent the spread of respiratory illnesses like the flu are:

- Avoid close contact with people who are sick. When you are sick, keep your distance from others to protect them against getting sick.
- Stay home when you are sick.
- Cover your mouth and nose with a tissue when coughing or sneezing.
- Wash your hands often will help protect you from germs.
- Avoid touching your eyes, nose, or mouth. Germs are spread when a person touches something that is contaminated with germs and then touches his or her eyes, nose, or mouth.
- Get enough rest. Inadequate rest and sleep can cause the breakdown of your immune system making you more vulnerable to the flu.

Appendix F: Visual Analogue Scales

Instructions: Place a mark through the area of the line that matches your feelings *right now*.

1. Happiness

None ————— **Extreme**

2. Anxiety

None ————— **Extreme**

3. Energetic

None ————— **Extreme**

4. Disappointed in Self

None ————— **Extreme**

5. Anger

None ————— **Extreme**

6. Calmness

None ————— **Extreme**

7. Dissatisfied with Weight/Size

None ————— **Extreme**

8. Healthy

None ————— **Extreme**

9. Irritability

None ————— **Extreme**

10. Dissatisfied with Body Shape

None ————— **Extreme**

Appendix G: Positive and Negative Affect Scale-Revised

Please circle the response that indicates how you feel currently/generally/over past two weeks.

	not at all	a little	moderately	a lot	extremely
1. Disgusted with self	1	2	3	4	5
2. Sad.	1	2	3	4	5
3. Afraid	1	2	3	4	5
4. Shaky.	1	2	3	4	5
5. Alone.	1	2	3	4	5
6. Blue.	1	2	3	4	5
7. Guilty	1	2	3	4	5
8. Nervous.	1	2	3	4	5
9. Lonely.	1	2	3	4	5
10. Jittery.	1	2	3	4	5
11. Ashamed	1	2	3	4	5
12. Scared	1	2	3	4	5
13. Angry at self	1	2	3	4	5
14. Downhearted.	1	2	3	4	5
15. Blameworthy.	1	2	3	4	5
16. Frightened	1	2	3	4	5
17. Dissatisfied with self.	1	2	3	4	5
18. Anxious.	1	2	3	4	5
19. Depressed	1	2	3	4	5
20. Worried	1	2	3	4	5

Appendix J: Eating Disorder Inventory-2

Body Dissatisfaction subscale:

1	2	3	4	5	6
Always	Usually	Often	Sometimes	Rarely	Never

Always.....Never

1. I think that my stomach is too big.
2. I think that my thighs are too large.
3. I think that my stomach is just the right size.
4. I feel satisfied with the shape of my body.
5. I like the shape of my buttocks.
6. I think my hips are too big.
7. I think that my thighs are just the right size.
8. I think that my buttocks are too large.
9. I think that my hips are just the right size.

Drive For Thinness subscale:

1. I eat sweets and carbohydrates without feeling nervous.
2. I think about dieting.
3. I feel extremely guilty after overeating.
4. I am terrified of gaining weight.
5. I am preoccupied with a desire to be thin.
6. If I gain a pound, I worry I will keep gaining.

Appendix L: Dutch Eating Behavior Questionnaire-Restraint Scale

Please indicate the best response to describe your usual behavior/behavior over the last two weeks:

Never Seldom Sometimes Often Always

1. Did you eat less than you normally would to lose weight?
2. Did you try to eat less at mealtimes than you would like to eat?.
3. How often did you refuse food or drink because you were concerned about your weight?
4. Did you watch exactly what you ate?
5. Did you deliberately eat foods that were slimming?
6. If you ate too much, did you eat less than usual the next day?
7. Did you deliberately eat less in order not to become heavier?
8. How often did you try not to eat between meals because you were watching your weight?
9. How often in the evenings did you try not to eat because you were watching your weight?
10. Did you take into account your weight in deciding what to eat?

Dieting Intentions

1. Do you plan to eat less than you normally would to lose weight?
2. Do you plan to eat less at mealtimes than you would like to eat?
3. Do you plan to refuse food or drink to lose weight?
4. Do you plan to watch exactly what you eat?
5. Do you plan to deliberately eat foods that are slimming?
6. If you overeat one day, do you plan to eat less than usual the next day?
7. Do you plan to deliberately eat less in order to not become heavier?
8. Do you plan to try to not eat between meals because you plan on watching your weight?
9. Do you plan to eat less in the evenings to control your weight?
10. Do you plan to take your weight into account when deciding what to eat?

Appendix M: Eating Disorder Examination-Questionnaire

Please circle the response that describes your behavior over the past week:

On how many days during the past week...

1. Have you felt fat?
2. Have you had a definite fear that you might gain weight or become fat?.....

Over the past week...

Not at all Slightly Moderately Extremely

- | | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3. Has your weight influenced how you think about (judge) yourself as a person? | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| 4. Has your shape influenced how you think about (judge) yourself as a person? | 0 | 1 | 2 | 3 | 4 | 5 | 6 |

1. During the past **week** have there been times when you felt you have eaten what other people would regard as an unusually large amount of food given the circumstances?
6. During the times when you ate an unusually large amount of food, did you experience a loss of control, i.e. feel you couldn't stop eating or control what or how much you were eating?
7. How many **times during the past week** have you eaten an unusually large amount of food and experienced a loss of control? _____ (please write in number or indicate zero)
8. During the past **week** have you had other times where you felt you uncontrollably ate a large amount of food, but the amount eaten would not have been considered large by most people?
9. How many **times during the past week** have you have uncontrollably eaten a large amount of food that others might not consider large? _____ (please write in number or indicate zero)
10. How many **times during the past week** have you made yourself sick in order to prevent weight gain or counteract the effects of eating? _____ (write in number or indicate zero)
11. How many **times during the past week** have you used laxatives or diuretics in order to prevent weight gain or counteract the effects of eating? _____ (write in number or indicate zero)
12. How many **times during the past week** have you engaged in excessive exercise specifically for the purpose of counteracting overeating episodes? _____ (write in number or indicate zero)

Appendix N: Modified Eating Disorder Examination-Questionnaire

Intentions

	Strongly Disagree	Somewhat Disagree	Neither Agree Nor Disagree	Somewhat Agree	Strongly Agree
1. I plan to make myself sick in order to prevent weight gain or counteract the effects of eating.	1	2	3	4	5
2. I plan to use laxatives or diuretics in order to prevent weight gain or counteract the effects of eating.	1	2	3	4	5
3. I plan to vigorously exercise for an hour or more in order to prevent weight gain or counteract the effects of eating.	1	2	3	4	5
4. I plan to use diet pills in order to prevent weight gain or help me lose weight.	1	2	3	4	5
5. I plan to smoke cigarettes in order to prevent weight gain or help me lose weight.	1	2	3	4	5
6. I plan to skip meals in order to prevent weight gain or help me lose weight.	1	2	3	4	5

Appendix O: Eating Disorder Inventory-3 Referral Form

In the past 3 months, how often have you.....

	Never	Once a month or less	2-3 times per month	Once a week	2-6 times per week	Once a day or more
1. Gone on eating binges (eating a large amount of food while feeling out of control)?	0	1	2	3	4	5
2. Made yourself sick (vomited) to control your weight?	0	1	2	3	4	5
3. Used laxatives to control your weight or shape?	0	1	2	3	4	5
4. Exercised 60 minutes or more to control your weight?	0	1	2	3	4	5
5. In the past 6 months, have you lost 20 pounds or more?	0	1	2	3	4	5

Appendix P: Multidimensional Health Behavior Inventory

Directions: The following statements describe a broad range of health-related actions or behaviors that you may or may not do. Read each behavior statement and circle the number following each statement that tells **how often you usually do this behavior/plan to/how often over the past two weeks have you:**

NEVER RARELY SOMETIMES OFTEN ALWAYS

1. Take time for relaxation every day.
2. Limit red meat in your diet every day.
3. Limit fat in your diet every day.
4. Eat red meat more than two times a week.
5. Eat fewer calories to lose weight.
6. Eat at least one serving or more of red meat on most days (include beef, pork, ham, bacon, lamb, liver, and lunch meat not made from poultry).
7. Limit sugar in your diet every day.
8. Eat non-fat or low-fat dairy products.
9. Do something good for yourself every day.
10. Choose foods with whole grains every day.
11. Check your cholesterol level at least once a year.
12. Seek health information.
13. Get adequate sleep every day.
14. Check your blood pressure at least twice a year.
15. Read food and medicine labels before purchasing or consuming the product.
16. Question your health care provider or seek a second opinion.
17. Maintain a first aid kit.
18. Get 7-8 hours sleep every day.
19. Participate in recreational physical activities at least twice a week.
20. Limit salt in your diet every day.
22. Limit intake of "sweets" in your diet.
23. Do stretching exercises every day.
24. Eat 2-3 servings of vegetables daily.
25. Obtain a regular health check-up when you are not sick.
26. Control stress in your life.
27. Exercise vigorously for at least 20 minutes 3 times a week.
28. Keep daily stress levels low.
29. Increase your physical activity to lose weight.
30. Run, jog, or swim for exercise at least 3 times per week.
31. Discuss health concerns with health resource person.
32. Eat 2-3 servings of fruit per day.
33. Eat at least one or more servings of the following items every day: chips, candy bars, cake, doughnuts, pastries, muffins, cookies, ice cream, pudding, chocolate.

Appendix Q: Pilot Study Attention Check Items

Directions: Based on the article you have just read, please circle True or False for each question.

Pro-Dieting, Obesity Prevention Message:

1. Only 15% of adults in the United States are overweight or obese.
2. There is little that can be done to prevent overweight and obesity.
3. Losing weight and/or maintaining a low body weight is very important in preventing overweight and obesity.
4. An individual is categorized as obese if he or she has a BMI of 30 or above.
5. People who are currently thin do not have to worry about preventing overweight or obesity.

Anti-Dieting, Eating Disorder Prevention Message

1. Only 1% of girls and women have disordered eating.
2. There is little that can be done to prevent disordered eating.
3. Stopping dieting is very important in the prevention of disordered eating.
4. Symptoms of disordered eating include overeating, restricting food intake, and compulsive exercising.
5. Genetics do not strongly influence body weight, size, and shape.

No-Dieting, Flu Prevention Control Message

1. About 80% of U.S. residents get the flu each year.
2. There is little that can be done to prevent the flu.
3. Getting vaccinated is very important in the prevention of the flu.
4. Symptoms of the flu include fever, headache, tiredness, sore throat, nasal congestion, and body aches.
5. Healthy people do not have to worry about complications from the flu.

Appendix R: Main Study Attention Check Items

Directions: Based on the article you have just read, please circle True or False for each question.

Pro-Dieting Condition:

1. 40% of adults in the United States are overweight or obese.
2. There is little that can be done to prevent overweight and obesity.
3. Most Americans should lose some fat, even those in the upper end of the average range.
4. An individual is categorized as obese if he or she has a BMI of 30 or above.
5. Thin people not have to worry about weight gain.

Anti-Dieting Condition:

1. Approximately 1-2% of girls and women have disordered eating.
2. There is little that can be done to prevent disordered eating.
3. Symptoms of disordered eating are often considered “normal” in our culture.
4. Dieting is unnecessary for weight control.
5. Genetics do not strongly influence body weight, size, and shape.

No-Dieting Control Condition:

1. About 80% of U.S. residents get the flu each year.
2. Gastro-intestinal symptoms are very common in adults who have the flu.
3. Getting vaccinated is very important in the prevention of the flu.
4. Three anti-viral drugs are available for use in preventing the flu.
5. Healthy people do not have to worry about complications from the flu.

Appendix S: Distraction Task

Now, I'd like you to take about 5-10 minutes to think about vacation destinations you have learned about through the media but have never been to. After giving it some thought, I'd like you to imagine your top 5 vacation destinations you have read about or heard about through the media but that you have not yet been to. Please take your time with this.

I'd like you to think about these places and visualize yourself on vacation in each of them. What would it be like? What would you be doing there? What would you see? What sensations would you feel?

To help you with this exercise, I'd like you to write your top 5 vacation destinations in the space below. I'd also like you to provide a brief description of each destination, what you would like to do and see there, and how the media has described this destination.

<u>Travel Destination</u>	<u>Activities/Sights/Feelings There</u>	<u>Media Description</u>
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1.

2.

3.

4.

5.

About the Author

Megan Roehrig received a Bachelor of Arts degree in Psychology from the University of Michigan in 1999, and a Masters of Arts degree in Clinical Psychology from the University of South Florida in 2003. She completed her pre-doctoral internship in clinical psychology at the University of Chicago Medical Center in 2007 and will begin a post-doctoral research associate position at Yale University School of Medicine in September of 2007. Her research is focused on risk factors, treatment, and prevention of eating disorders and obesity, bariatric surgery outcome, and body image assessment. She has co-authored several peer-reviewed journal articles and book chapters in this field.