

GOALS, EXPECTATIONS, AND SATISFACTION
IN THE MAINTENANCE OF WEIGHT LOSS

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TABLE OF CONTENTS

List of Tables	v
Acknowledgements.....	vi
Abstract.....	x
Introduction	
Scope of the Obesity Epidemic.....	1
Treatment of Obesity	2
The Challenge of Maintaining Weight loss	6
A Conceptual Difference Between the Initiation and Maintenance of Behavioral Changes	8
Literature Review of Goal Setting	11
Goal Setting Theory.....	11
Social Cognitive Theory.....	13
Control Theory.....	14
The Role of Expectations in Goal Setting.....	17
The Relationship Between Goals, Expectations, and Satisfaction	22
Goals, Expectations, and Weight Loss	25
Satisfaction and Weight Loss	37
Measurement of Goals, Expectations, and Satisfaction with Weight Loss	41
Goals, Expectations, and Satisfaction in the Treatment of Obesity	43
Limitations of Previous Research	44
The Present Study	45
Hypotheses.....	46
Method	
Research Design.....	48
Participants.....	48
Measures	49
Procedure	55
Analytic Strategy	56
Results	
Data Screening.....	60
Descriptive Characteristics	64
Correlations Between Potential Control Variables and Criterion Variables	70
Primary Analyses.....	74
Secondary Analyses.....	78

Discussion.....	83
References.....	95
Appendices.....	113
A. Informed Consent – University of Kansas	
B. Informed Consent – University of Kansas Medical Center	
C. Demographics Form	

LIST OF TABLES

1. Reasons for attrition.....	61
2. Descriptive statistics for primary variables.....	63
3. Characteristics of sample	65
4. Weight loss intervention characteristics	67
5. Defined weights and associated ratings at baseline	70
6. Correlations between potential covariates and weight change	72
7. Correlations between potential covariates and satisfaction	73
8. Correlational matrix of predictor and criterion variables	74

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ABSTRACT

Obesity is a steadily growing epidemic with serious health related consequences. Over the last several decades, the treatment of obesity has evolved and now successfully yields weight losses of typically 5-10%. However, long-term weight loss maintenance remains elusive. Research has identified the strategies that are essential in maintaining weight loss, however an understanding of the psychological processes that drive these behaviors is lacking. It has been suggested that there is a fundamental difference between the processes that underlie the initiation of behavior change and the maintenance of these changes, and that little attention has been paid to the processes that sustain behavior change over time. The goals that individuals set, the expectations for attaining these goals, and the satisfaction associated with the outcome of these efforts may impact weight loss and weight loss maintenance. These constructs have been examined in the context of weight loss, but they have yet to be explored in the weight loss maintenance phase. This study examined the impact of goals, expectations, and satisfaction on weight loss maintenance in individuals who completed a weight loss program and were striving to maintain their weight losses. Participants included men and women ($N = 67$) who had recently lost at least 5% of their body weight. They were weighed and completed psychological measures at baseline, 2 months, and 4 months. Results indicated that there was no support for the hypothesis that goals, expectations, and satisfaction predict weight loss maintenance. In addition, goals and expectations for weight loss maintenance did not predict satisfaction with weight. Implications and future directions are discussed.

INTRODUCTION

Scope of the Obesity Epidemic

Obesity is a significant problem in the United States. It is estimated that 66.3% of the population is overweight or obese, 32.2% is obese, and 4.8% is extremely obese (Ogden et al., 2006). Between 1980 and 2002, the prevalence of obesity has doubled in adults 20 years or older (Flegal, Carroll, Ogden, & Johnson, 2002; Hedley et al., 2004). There also appear to be significant differences in the prevalence of obesity among racial/ethnic groups. Approximately 30% of non-Hispanic white adults are obese, as compared to 45% of non-Hispanic black adults and 37% of Mexican American adults (Ogden et al., 2006). Obesity is defined as an excess of body fat and is most often quantified in terms of body mass index (BMI), which is calculated by dividing weight in kilograms by height in meters squared. *Overweight* is defined as a BMI of 25 to 29.9 kg/m², *obese* is defined as a BMI of greater than or equal to 30 kg/m², and *extremely obese* is defined as a BMI of greater than 40 kg/m².

Obesity is associated with various health risks, as well as negative economic and social consequences. Obesity is a major risk factor for premature mortality, cardiovascular disease, type 2 diabetes, hypertension, dyslipidemia, stroke, gallbladder disease, respiratory dysfunction, gout, osteoarthritis, and certain cancers (Fontaine, Redden, Wang, Westfall, & Allison, 2003; Must et al., 1999). Obesity is attributable to an estimated 112,000 to 280,000 deaths in the United States each year, and it is projected to overtake smoking as the primary preventable cause of disease

and death (Allison, Fontaine, Manson, Stevens, & Van Itallie, 1999; Centers for Disease Control and Prevention, 2002). In addition, the medical cost of obesity in the United States in 1998 was estimated at \$78.5 billion (Finkelstein, Fiebelkorn, & Wang, 2003), and more recent studies show that in 2008, the estimated cost of obesity could have risen to \$147 billion (Finkelstein, Trogon, Cohen, & Dietz, 2009). On a social level, obese individuals are vulnerable to prejudice in the areas of employment, health care, and education and are often assumed to lack willpower, motivation, and personal control (Puhl & Brownell, 2001).

Treatment of Obesity

Philosophies of obesity treatment have evolved over the last several decades. Stunkard and McLaren-Hume's (1959) seminal review described the dismal state of obesity research over 45 years ago. It was concluded that of the few patients who completed treatment, few lost weight and even fewer maintained these weight losses. This report led to a number of treatment outcome studies in the 1970's in which 10-week behavioral treatment programs produced weight losses of approximately 4 kg (8.8 lbs), with most of those weight losses maintained one year after treatment (Wadden, 1993). Although this signified progress in the field, a 4 kg weight loss was considered to be of limited value for patients who weighed over 100 kg (220 lbs). Over the next two decades, treatment programs evolved in many ways, from lengthening the course of treatment to emphasizing energy balance and prescribing specific dietary and exercise goals for patients. Treatment in the 1980's consisted of aggressive approaches that combined various interventions, such as very low calorie

diets and pharmacotherapy, with behavior modification to accomplish more significant weight losses (Brownell, 1982; Brownell & Wadden, 1986; 1992). Thus, the philosophy of obesity treatment was to reduce to “ideal” body weight, as defined by height-weight charts. These efforts proved to be successful in achieving large weight losses, nearly doubling the weight losses of more conservative approaches. However, the challenge of maintaining these weight losses persisted (Brownell & Stunkard, 1981).

In the 1990’s a shift occurred from aggressively reducing body weight through large weight losses to recommending more moderate changes in weight and behavior (Brownell & Wadden, 1991). Foster (1995) outlines several factors that supported this shift in philosophy: (a) findings that many obesity-related conditions (e.g., diabetes, hypertension, hyperlipidemia, and sleep apnea) are significantly improved with modest weight losses of 5-10% (Blackburn, 1999; Goldstein, 1992); (b) a body of research which indicates the reality of biological and genetic boundaries that may prevent individuals from achieving their “ideal” weights (Meyer & Stunkard, 1993; Wilson, 1994); (c) the assumption that moderate changes in weight and behavior are better maintained than more extreme changes (Wadden, Foster, & Letizia, 1994); (d) the inappropriateness of height-weight charts (Harrison, 1985); and (e) the desire to counter the cultural pressures of achieving an ideal thinness, particularly for women (Brownell, 1991a). It was within this context that the idea of a more “reasonable” weight was proposed, and this shift was reflected in expert panels and governmental guidelines for obesity treatment. The U.S Department of

Agriculture Dietary Guidelines recommends that modest weight losses are of benefit to obese individuals (2005) and the Institute of Medicine of the National Academy of Sciences (1995) defines successful long-term weight loss as a 5% or greater reduction in body weight that has been maintained for at least 1 year. In summary, there seems to be a growing consensus among professionals that 5-10% weight losses are reasonable and should be considered successful.

Various treatments have been shown to be effective in yielding weight losses of approximately 5-10% of body weight, which are associated with significant physical and psychological benefits (Blackburn, 1999). Behavioral interventions are the most commonly recommended treatment, and have been shown to be successful when combined with a low-calorie diet and physical activity (Wing, 2002). Approximately 80-85% of participants complete treatment and typically lose 8-10% of their initial body weight during the first 6 months of treatment (Foster, Makris, & Bailer, 2005).

Behavioral treatment is used to help individuals develop skills to achieve a healthier weight and includes certain factors that are believed to contribute to successful weight loss. Treatment is very goal-oriented, includes frequent visits, is time-limited, is typically delivered in a closed group setting, and emphasizes flexibility (Foster et al., 2005; Wadden & Osei, 2002). Participants are taught a variety of techniques, such as self-monitoring, stimulus control, problem solving, preplanning, cognitive restructuring, social support, nutrition education, physical activity, the use of reinforcement contingencies, and relapse prevention (Brownell,

2000; Wing, 2002). Behavioral treatment is most helpful for individuals who have been unable to lose weight on their own or with self-help or commercial programs. The major limitation of behavioral treatment is its limited availability and generalizability to the general public, as many of these programs are found in the context of university-based research programs (Foster et al., 2005).

Two additional treatment options for individuals who are considered obese include low-calorie, portion controlled diets and pharmacotherapy. Structured meal plans and liquid meal replacements are used to induce larger weight losses than those achieved by more conventional diets with the same caloric restrictions. Very-low-calorie-diets (VLCDs) can produce weight losses of approximately 15-25% of initial weight in 2 to 4 months of treatment, but may also result in substantially greater weight regain than more conventional, calorie-restrictive diets (Wadden & Osei, 2002).

Pharmacological interventions have been presented as options for individuals who are at high risk for obesity-related health complications. Two medications are currently approved by the U.S. Food and Drug Administration for long-term use, and have successfully produced 8-10% losses of initial weight in the first 6 months of treatment (Wadden & Osei, 2002). Sibutramine (Meridia) works to suppress appetite by increasing the activity of norepinephrine and serotonin in the brain. Orlistat (Zenical) works to block the absorption and digestion of one-third of dietary fats contained in a meal (Bray & Greenway, 2000). These two treatment options may be

optimal when combined with behavioral treatment (Wadden, Berkowitz, Sarwer, Prus-Wisneiewski, & Steinberg, 2001).

Surgical treatment of obesity is recommended in the most severe circumstances, most often for individuals with a BMI of greater than 40 kg/m² who have significant health complications and who have been unable to lose weight through other approaches. Surgical interventions include vertical banded gastroplasty, gastric bypass, and gastric banding procedures. Gastric bypass seems to be the procedure of choice, as it yields reductions of 25-30% of weight, and is associated with good long-term maintenance of weight loss (Latifi, Kellum, De Maria, & Sugarman, 2002).

The Challenge of Maintaining Weight Loss

Most weight loss interventions have been found to be successful in the short-term, but less successful in the long-term (Jeffery et al., 2000; Perri & Foreyt, 2004). Studies of long-term weight loss maintenance show individuals regaining 30-50% of their lost weight in the year following treatment (Jeffery et al., 2000; Perri & Corsica, 2002), and a consistent pattern of weight regain in the 2-5 years following treatment (Perri, 1998; Wadden, Brownell, & Foster, 2002).

In an effort to increase rates of long-term weight loss maintenance, research has examined the factors associated with successful weight loss maintenance. Successful weight loss maintainers use various strategies to achieve long-term weight loss maintenance, most often displaying a continued use of the behavioral strategies that helped them successfully lose weight initially. These strategies include high

levels of physical activity, consumption of a low-calorie, low-fat diet, regular consumption of breakfast, regular self-monitoring of weight and food intake, and the use of positive coping strategies in response to lapses in diet and exercise adherence (Anderson, Konz, Frederich & Wood, 2001; Wing & Hill, 2001; Wing & Phelan, 2005).

Factors associated with weight regain have also been examined. Predictors of weight regain include a higher maximum weight, a greater initial loss of weight, a greater history of weight cycling, greater dissatisfaction with post-treatment weight, higher levels of disinhibition and depressive symptomology, and the desire to continue losing weight (rather than maintaining or gaining) following treatment (McGuire, Wing, Klem, Lang, & Hill, 1999). Weight regain also appears to be due to individuals' inability to engage in the behaviors that are essential for maintaining weight losses (Byrne, Cooper & Fairburn, 2004; Wing & Phelan, 2005).

Although research has revealed what individuals must do to maintain their weight losses, little is known about the psychological mechanisms that lead some to engage in essential weight loss maintenance behaviors and others to abandon these behaviors (Byrne, 2002). A few psychological factors have emerged as explanations for why some succeed and others fail at maintaining weight losses. Research has suggested that those who successfully maintain their weight losses possess better coping and problem-solving skills (Gormally & Rardin, 1981), report greater levels of self-efficacy related to their ability to control their weight and their food intake (Gormally, Rardin, & Black, 1980; Jeffery et al., 1984), are more vigilant regarding

weight control than those who regain their weight losses (Byrne, 2002; Colvin & Olson, 1983), and report that the benefits of weight loss maintenance justify the effort required (Klem, Wing, Lang, McGuire, & Hill, 2000). Several studies have emphasized the importance of weight loss goals, suggesting that those who achieve their weight loss goals may be more successful and more satisfied than those who do not reach their goals (Colvin & Olson, 1983; McGuire et al., 1999). It has been hypothesized that the discrepancy between a goal weight and actual weight may lead to dissatisfaction and the belief that further attempts to lose weight will be unsuccessful, resulting in the abandonment of critical weight maintenance behaviors (Byrne, 2002; Cooper & Fairburn, 2002; Perri & Foreyt, 2004). In summary, further exploration of the psychological processes associated with weight loss maintenance may be important in facilitating successful weight loss maintenance.

A Conceptual Difference Between the Initiation and Maintenance of Behavioral Changes

Rothman (2000) has explored the ways in which theories of health behavior change have operationalized the processes that underlie the initiation and maintenance of behavior change. He describes the ways in which interventions based on these theories have reliably elicited behavior change in areas of smoking, weight control, and exercise. However, he points out that the strategies that have produced success in initial behavior change have often failed to facilitate long-term maintenance of these changes. The dominant models of health behavior change have focused on explaining the processes by which changes are made, but many of these

theories do not address issues regarding the maintenance of these changes. It has been assumed that the psychological processes that facilitate behavior change are the same processes that facilitate behavior change maintenance, and as a result, the major theories of health behavior change have not offered much guidance as to how the processes that govern initiation and maintenance of behavior change may differ.

Rothman (2000) theorizes that the psychological factors that enable people to adopt a new pattern of behavior are fundamentally different than those that sustain the behavior over time. Theories of behavior change have placed an emphasis on an individuals' assessment of the costs and benefits of making particular changes. While this approach has been successful in shaping interventions that facilitate initial changes in behavior, the same strategies have not been effective in promoting long-term maintenance of these changes. Rothman (2000) developed a new theoretical framework based on the belief that initiation of behavior change and maintenance of behavior change are based on different decisional processes. He notes that the decision to initiate behavior change is based on beliefs about the favorable expectations associated with the change in behavior. On the other hand, the decision to maintain a change in behavior is based on the satisfaction associated with the outcomes produced by the behavior. Satisfaction should reinforce the initial decision to change the behavior and sustain the continued effort that is necessary to maintain the change. More specifically, successful initiation of a behavior change is motivated by a desire to change one's current situation, whereas successful maintenance is motivated by a desire to preserve one's current situation.

If the processes of initiating and maintaining behavior changes are indeed fundamentally different, then certain factors that facilitate the initiation of behavior change may not have the same impact on the maintenance of behavior change. Rothman (2000) concludes that further exploration of the psychological processes underlying the initiation and maintenance of behavior change is warranted to better understand how these two processes differ. A clearer understanding of this differentiation may lead to interventions that are more successful in maintaining behavior changes. This is particularly relevant to the area of weight loss maintenance, given the limited success people have in maintaining their weight losses. It is important to examine the ways in which the process of weight loss maintenance may differ from that of weight loss.

So the question remains: What influences successful weight loss maintenance? Beyond the behaviors that are critical for maintaining weight losses, it is essential to better understand the mechanisms that drive the continued use of weight loss maintenance strategies, as well as the differences in attitudes between those who successfully maintain their weight losses and those who regain their weight. Given that there is little known about the psychological mechanisms involved in weight maintenance, along with the assertion that the maintenance of behavior change is markedly different than the initiation of behavior change, it is important to further examine the psychological processes that may be related to successful weight loss maintenance.

Literature Review of Goal Setting

Much of human behavior is fundamentally driven by goals. Individuals are constantly setting goals, monitoring progress, and adjusting their effort to accomplish these goals. Lee, Locke, and Latham (1989) define a goal as “that which one wants to accomplish; it concerns a valued, future end state.” Goals provide structure, coherence and meaning to life (Emmons, 1996), can be concrete or abstract, and can vary in difficulty, specificity, and complexity (Carver, Lawrence, & Scheier, 1996). Various theoretical perspectives have explored the relationship between goal setting and outcomes as well as the consequences of failure to achieve goals.

Goal-setting theory. Locke and Latham (2002) have done extensive work on goal setting, and their review of 35 years of empirical research in this area has yielded many interesting findings. There appears to be a robust influence of specific and challenging goals on human motivation and achievement. A positive linear relationship has been found between goals and performance, meaning that the highest or most difficult goals produce the most effort and performance. This performance, however, plateaus or decreases when goals exceed ability or when commitment to a highly difficult goal wanes (Erez & Zidon, 1984). It has also been found that assigning specific, challenging goals enhances performance more than not assigning goals or giving general instructions to “do your best” (Locke & Latham, 1990; Tubbs, 1986). Setting a goal, in and of itself, does not automatically motivate higher performance. However, if an individual desires to achieve the goal and is free of other goals that may conflict with the goal, goal setting can motivate higher

performance. In addition, setting specific goals reduces the ambiguity of the goal, resulting in less variation in performance. Locke and Latham (2002) describe three mechanisms by which setting goals can have a beneficial effect on performance: effort, persistence, and concentration. However, these three mechanisms do not always lead to greater performance when the task is complex or of great difficulty for the individual.

Locke and Latham (2002) describe variables that moderate the relationship between goal setting and outcome. The relationship between goals and outcomes is strongest when people are committed to their goals, particularly when the goals are difficult. The level of importance of the goal and self-efficacy that the goal can be attained are two factors that facilitate goal commitment. Goal setting theory also indicates that feedback moderates the relationship between goals and performance; for goals to effectively impact outcome, individuals need summary feedback to help monitor progress toward the goal. This feedback is essential in informing individuals so they can reevaluate and adjust their efforts accordingly. It is predicted that if the goal is not achieved, dissatisfaction occurs and that this dissatisfaction fuels greater subsequent effort, concentration and persistence. Goal setting theory describes a few conditions in which goal setting does not enhance performance: (a) when the goal is a task that is complex for the individual; (b) when the individual is unable to perform behaviors related to the goals; and (c) when the individual is not committed to the goals. In these circumstances, goal setting, and the effort, persistence, and concentration that accompany it may lead to premature attempts at highly complex

tasks, which may lead to reduced self-efficacy and negative attributional states (Strecher, 1995). Much of this research has been conducted in the context of industrial organizational psychology, but some of the principles of this theory of goal setting have been applied to weight loss. A few studies have explored the effects of challenging weight loss goals on weight loss outcomes, and the ways in which dissatisfaction may affect subsequent effort toward weight loss or maintenance and these studies will be reviewed subsequently (Finch, Linde, Jeffery, Rothman, King, & Levy, 2005; Jeffery, Wing & Mayer, 1998; Linde, Jeffery, Finch, Ng, & Rothman, 2004; Oettingen & Wadden, 1991).

Social Cognitive Theory. The social cognitive theory perspective focuses on the role of cognitive processes that mediate the effects of goals on performance. Emphasis is placed on the motivational power of these processes on goal setting, rather than the actual goal itself (Cervone, Jiwani, & Wood, 1991). When working toward a particular goal, individuals will assess the relationship between what they hope to accomplish and what they have actually accomplished, engaging in cognitive processes such as evaluation of one's performance, judgments of ability to succeed at the goal, and personal goal setting. Social cognitive theory also takes into account the importance of self-efficacy, which is defined as "the conviction that one can successfully execute the behavior required to produce the outcomes" (Bandura, 1977, p. 79). Individuals with higher self-efficacy set higher goals, are more committed to assigned goals, find and use better strategies to reach the goals, and respond more positively to negative feedback than individuals with lower self-efficacy (Locke &

Latham, 1990). It is noted that goal-setting theory is consistent with social-cognitive theory in that both acknowledge the importance of conscious goals and self-efficacy; goal setting theory focuses more on the core properties of a goal, whereas social-cognitive theory focuses more on self-efficacy. This can be applied to weight loss and maintenance, as there is a need to better understand the processes by which individuals evaluate their progress towards goals and their self-efficacy related to these goals (Foster, Wadden, Vogt, & Brewer, 1997).

Control Theory. Carver and Sheier (1982; 1990) examined the process of how individuals react affectively when they realize there is a discrepancy between their present state and their expected state. It is believed that individuals modify their behavior with further attempts toward their goals as a result of processing this discrepancy, often in an effort to reduce the discrepancy between actual and expected outcomes. However, it is noted that expectancies about one's ability to reduce this discrepancy play an important role in this process; if expectancies are favorable, individuals are likely to continue to attempt working toward their goals and if expectancies are unfavorable, individuals are likely to experience an impulse to withdraw or disengage from their efforts. Individuals may disengage from their efforts, but it is noted that the social environment does not often allow a permanent disengagement, which leads to a vicious cycle of inability to reach goals, an awareness of that inability, and negative feelings as a result of that awareness. This is highly relevant to weight loss and maintenance, as individuals are commonly confronted with the discrepancy between the weight losses they have actually

accomplished and what they had hoped to achieve. A few studies have explored the ways in which individuals respond to these discrepancies, but the consequences of unmet goals have not yet been thoroughly examined (Finch et al., 2005; Foster et al., 2004; Wadden et al., 2003).

It is clear that people are not always successful at attaining their goals. Whether this is due to external constraints or personal inadequacies, people often experience frustration with the discrepancy between their actual state and their desired state (Carver & Sheier, 1990). When goals are not met or remain out of reach, individuals experience a variety of negative consequences such as (a) negative affect, (b) aversive self-focus; (c) dissatisfaction, and (d) subsequent performance that is impaired (Carver & Sheier, 1990; 1992; Higgins, 1987; Sarason, Sarason & Pierce, 1990; Wicklund & Gollwitzer, 1982). These negative reactions may transition to a cycle of aversive self-focus and self-preoccupation, leading to intensified negative affect, self-criticism, self-blame, and subsequent negative outcomes, resulting in a depressive self-focusing style (Ahrens, 1987; Nolen-Hoeksema, 1991; Pyszczynski & Greenberg, 1987; Rehm, 1977; Sarason, Sarason, & Pierce, 1990). If negative affect is intense enough, or expectancies about goal attainment become exceedingly unfavorable, the person may disengage from pursuit of the goal (Carver & Scheier, 1990). Disengagement from goals may lead to what Klinger (1975; 1987) describes as an “incentive-disengagement cycle” that occurs as a process of disengaging from a goal. When people experience obstacles to their stated goals, they initially respond with invigoration and an increased effort toward goal attainment. When their efforts

do not yield the results they desire, they experience frustration and subsequently feelings of failure, loss, disappointment, and potentially depression. These feelings of disappointment may lead to apathy and a total disengagement from their original goal. It is possible that individuals who are struggling with weight loss and maintenance will experience these negative consequences of unmet goals, and a few studies have begun to explore the ways in which individuals respond when their goals are out of reach (Finch et al., 2005; Foster et al., 2004; Wadden et al., 2003).

In summary, theories of goal setting have addressed the relationship between goal difficulty and performance and the consequences of unmet goals. A positive linear relationship between goals and performance is clearly documented, and various constructs, such as effort, persistence, concentration, commitment, self-efficacy, and feedback are said to influence the relationship between goals and performance (Bandura, 1977; Cervone et al., 1991; Locke & Latham, 1990; 2002). When goals are not achieved, individuals initially respond with renewed effort, but if failure to attain the goal persists, they are prone to various negative consequences, including disengagement from pursuit of the goal and negative affect (Carver & Scheier, 1982; 1990; Higgins, 1987; Klinger, 1987; Nolen-Hoeksema, 1991; Sarason et al., 1990; Wicklund & Gollwitzer, 1982). Several principles of these theories of goal setting are relevant to weight loss and maintenance, and there has been some interest in understanding the ways in which weight loss goals may impact weight loss outcomes and how individuals respond to goals that have not been achieved (Ames et al., 2005;

Finch et al., 2005; Foster et al., 2004; Jeffery et al., 1998; Linde et al., 2004; 2005; Wadden et al., 2003).

The Role of Expectations in Goal Setting

Many theoretical approaches emphasize the role of expectations in determining how individuals respond to obstacles encountered in the pursuit of goals. Goals and expectations are often thought to be interchangeable, but social-cognitive theories have treated them as separate variables. Expectations are probability judgments about the occurrence of certain desirable or undesirable events (Bandura 1986; Bernier & Avard, 1986). The idea that adopting a behavior is a function of expectations about the consequences of the behavior is in line with many cognitive theories of behavior change that have been applied to the domain of health psychology. Such theories include the theory of reasoned action (Ajzen & Fishbein, 1980), self-determination theory (Deci & Ryan, 1985), social cognitive theory (Bandura, 1986), the health belief model (Rosenstock, Strecher & Becker, 1988), the theory of planned behavior (Ajzen, 1991), and the transtheoretical model of health behavior change (Prochaska, DiClemente & Norcross, 1992). Expectations play an important role in influencing the effort that individuals put forth toward goals, determining whether they respond to obstacles with continued effort or by disengaging from the goal.

Scheier and Carver (1992) indicate that expectations are the cornerstone of theories of motivated action (Bandura, 1977; Rotter, 1954; Seligman, 1975); expectancies about goal attainment determine what further action is taken regarding

pursuit of the goal. If expectancies are favorable, people tend to have positive feelings that lead to continued efforts toward goal attainment and enhanced performance. If expectancies are unfavorable, individuals tend to have negative feelings that may lead them to reduced effort, abandonment of the goal, and subsequently, lower performance (Bandura, 1986; Carver & Scheier, 1981; 1990; Cervone, 1993; Klinger, 1975; 1987; Locke & Latham, 1990). It is also noted that discrepancies between expectancies and goals may lead to negative affective states such as depression and anxiety (Beck, 1967; Rehm, 1977; 1986; Schlenker & Leary, 1982; Wallace & Alden, 1991). Expectations are an important construct in weight loss and maintenance, as they affect the amount of effort put forth toward goals for weight loss. Some studies have started to examine the ways that expectations impact weight loss outcomes (Ames et al., 2005; Finch et al., 2005; Oettengin & Wadden, 1991; Wadden et al., 2003), however, to date, no studies have examined individuals' expectations for weight loss maintenance.

It seems that the more positive the expectations, the more effort is put forth. A logical construct to consider in this discussion is optimism. A growing body of research indicates that positive thinking has a beneficial effect on mental health and well-being (Peterson, 2000; Taylor & Brown, 1988). Optimism has been described as “a mood or attitude associated with an expectation about the social or material future – one which the evaluator regards as socially desirable, to his [or her] advantage, for his [or her] pleasure” (Tiger, 1979, p. 18). Optimism has been examined extensively as a beneficial characteristic that is linked to positive mood, increased happiness,

perseverance, effective problem solving, achievement, productivity, creativity, successful coping, and good physical health. In addition, optimistic thinking buffers against depression, alcoholism, and obesity, and is linked to physical well-being (for reviews, see Peterson, 2000; Taylor & Brown, 1988; Scheier & Carver, 1992). Relatedly, Taylor and Brown (1988) have summarized many studies in social, personality, developmental, and clinical psychology showing that individuals are biased toward unrealistically positive views of themselves, concluding that “positive illusions” are highly adaptive in many circumstances. It has been shown that positive thinking, even when illusory, is associated with enhanced motivation and performance, in that high expectations of success lead people to work harder and persist more than low expectations of success (Atkinson, 1964; Mischel, 1973). Taylor (1989) proposes that individuals’ tendencies to see themselves in a positive light is indicative of well-being by facilitating intellectually creative functioning and enhancing motivation, performance, and persistence.

Snyder’s (1991) theory of hope also addresses expectations for goal attainment; it is related to theories of optimism but incorporates the concept of pathways (Snyder, 2000). Hope is defined as “a positive motivational state that is based on an interactively derived sense of (a) agency (goal directed energy), and (b) pathways (planning to meet goals)” (Snyder, Irving & Anderson, 1991, p. 287). According to hope theory, expectations for goal attainment include 3 components: goals, agency, and pathways. *Agency* is described as an individual’s determination that goals can be achieved and *pathways* are an individual’s belief that they can

produce one or more successful routes to reach their goals. It is theorized that both the energy toward these goals and the ability to generate viable routes are necessary for effective goal-directed thinking. Several studies have shown higher hope to be correlated with better psychological adjustment, improvements in health, and higher achievement. No studies have specifically examined hope theory in the context of weight loss, but a few studies have examined the impact of high expectations on weight loss outcomes (Finch et al., 2005; Jeffery et al., 1998; Linde et al., 2004; 2005).

It is well established that optimistic and hopeful thinking, even when illusory, is of benefit to people in motivation, cognition, and affect. However, it is important to consider at what point this positive thinking may have an effect that is not entirely positive. Optimism does have its drawbacks, particularly when it is too unrealistic or illusory, and even Taylor (1989) distinguishes between optimism as an illusion and optimism as a delusion. Oettingen (1996) further delineates the issue in defining two kinds of optimistic thinking: “optimistic expectations” are beliefs about the likelihood of certain events occurring versus “spontaneously generated positive fantasies” which are essentially daydreams depicting future events and scenarios. When in the form of positive fantasies, optimism may serve as a distraction from making concrete strategies for attaining goals (Oettingen, 1996). This unrealistic optimism (or “fantasies”) may take a toll on individuals if they are putting forth effort toward an unattainable goal, leading to potential for frustration and demoralization (Peterson, 2000).

Polivy and Herman (2002) describe the “false hope syndrome” which is characterized by unrealistic expectations about the resources needed to succeed at a given goal or self-change attempt. Much research in various areas of health behavior change, such as smoking cessation and alcohol addiction, has shown that resolutions to change most often fail (see Prochaska et al., 1992 for a review). The false hope syndrome is described as such: a difficult (and often impossible) task related to change is undertaken, with unrealistic expectations about the speed, ease, amount, and rewards of self-change. Some progress toward the goal is achieved, but ultimately the goal is not achieved or success is not sustained. Failure leads to the belief that if adjustments are made to the behavior, success will follow, or that the rewards are worth continued attempts at success. Attempts to change the particular behavior follow, fueled by positive expectations of success, resulting in a cycle of failure, interpretation, and renewed attempts to change (Polivy & Herman, 2002). It should be noted that not all self-change attempts result in failure, however this cycle is all too apparent in empirical literature as well as mainstream media (Prochaska et al., 1992). This cycle of false hope leads to impaired self-esteem and depressed mood, which may negatively impact subsequent attempts to change (Kuhl & Helle, 1986; Polivy & Herman, 2002). These concepts of optimism and false hope are highly relevant to weight loss and maintenance and there has been some exploration of the idea that high expectations for weight loss may have negative consequences (Ames et al., 2005; Finch et al., 2005; Foster et al., 2004; Jeffery et al., 1998; Linde et al., 2004; 2005; Oettingen & Wadden, 1991; Wadden et al., 2003).

Goals and expectations are separate but related constructs; expectations appear to influence the amount of effort expended toward meeting a goal. It appears that the discrepancy between goals and expectations may lead to various negative consequences (e.g., negative affect and withdrawal). There is some debate about the consequences of illusory optimism, with some evidence that highly unrealistic expectations may ultimately be harmful. Decreasing the disparity between actual and expected outcomes appears to lessen the negative affect associated with unmet expectations (Hsee & Abelson, 1991; McIntosh, 1996). Examining these ideas in the context of weight loss and maintenance may provide rich information on how individuals approach and respond to weight loss.

The Relationship Between Goals, Expectations, and Satisfaction

Satisfaction is closely related to goals and expectations because individuals naturally evaluate their performance and the outcome of their efforts. Social psychological studies of satisfaction have found a complex relationship between satisfaction and outcome (Hsee & Abelson, 1991). There is a positive relationship between outcome and satisfaction: the more positive an outcome, the greater the satisfaction. More specifically, satisfaction depends on the change in outcome; if the outcome changes in a positive direction, satisfaction follows and if the outcome changes in a negative direction, dissatisfaction follows. The more an outcome departs from its original position in a positive direction, the greater the satisfaction. Similarly, Locke and Latham (2002) theorize that exceeding a goal provides

increasing satisfaction, as a positive discrepancy grows, whereas not reaching a goal leads to increasing dissatisfaction, as a negative discrepancy grows.

When a negative discrepancy exists between expected and actual outcomes, individuals experience dissatisfaction with their performance (Carver & Scheier, 1990; Higgins, 1987; Locke & Latham, 2002). Dissatisfaction with the outcome of one's efforts can lead to different reactions. One on hand, dissatisfaction with less than desirable outcomes can lead to greater effort, concentration, and persistence (Bandura & Cervone, 1983; 1986; Carver & Scheier, 1982; 1990; Locke & Latham, 2002). In laboratory studies, when individuals working on simple motor tasks experienced dissatisfaction with their performance, this led to a subsequent increase in their effort (Bandura & Cervone, 1983).

On the other hand, dissatisfaction with prior outcomes has also been found to lead to impaired performance. Cervone and colleagues (1991) examined the effects of goal setting and cognitive self-regulatory processes on a complex decision making performance. Contrary to previous findings on simple tasks (Bandura & Cervone, 1983), dissatisfaction with prior outcomes impaired performance. Subjects who were dissatisfied with their outcomes exerted much effort on subsequent tasks but used inferior strategies that produced poorer results. Because these findings seem to contradict previous findings, it has been concluded that on both simple and complex tasks, a commitment to difficult goals leads to dissatisfaction with lower than expected outcomes. On simple tasks, dissatisfaction will enhance effort, and on complex tasks, dissatisfaction has the potential to interfere with cognitive processes

that are critical to success and can subsequently lead one to abandon their effort toward the goal (Bandura & Cervone, 1983; Cervone et al., 1991).

In addition, dissatisfaction with unmet goals can lead to negative affect, depression, and aversive self-focus (Ahrens, 1987; Carver & Scheier, 1990; 1982; Higgins, 1987; Rehm, 1977; Sarason et al., 1990; Wicklund & Gollwitzer, 1982). These reactions may lead to a vicious cycle of negative emotion, which may subsequently result in disengagement and withdrawal from the goal.

Rothman (2000), in his discussion of the conceptual difference between behavior change and behavior maintenance, notes that maintaining behavior change is in large part related to the satisfaction that individuals have with the outcomes they have obtained. The premise is that people will maintain a change in behavior only if they are satisfied with what they have accomplished so far. People will be satisfied when they have met or exceeded their expectations and they will be dissatisfied when they have failed to meet their expectations, ultimately undermining maintenance of the new behavior. In summary, dissatisfaction with outcomes has been found to be associated with impaired performance and negative affect. Dissatisfaction may adversely affect maintenance of behavior change by affecting the amount of effort put forth toward goals, possibly resulting in withdrawal from the goals. Further exploring the ways in which dissatisfaction affects subsequent effort is particularly relevant to individuals who are assessing their weight loss outcomes and attempting to maintain their weight losses. Research shows that obese individuals are generally dissatisfied with the outcomes of weight loss treatment (Brownell, 1991a; 1991b; Foster et al.,

1997), but there has not yet been a thorough investigation of the impact of this dissatisfaction on weight loss maintenance.

Goals, Expectations, and Weight Loss

Within the area of obesity and weight loss maintenance, there has been an examination of patients' goals and expectations for weight loss. Foster and colleagues (1997) examined patient goals, expectations, and evaluations of obesity treatment in 60 obese women who were participating in weight loss treatment. Patients were asked to define their goal weight and four other weights: their "dream weight," "happy weight," "acceptable weight," and "disappointed weight." On average, patients defined their goal weights as a 32% reduction in body weight, and their dream weights required a 37% reduction in body weight. They judged a weight loss of 25% as only "acceptable" and indicated that they would be "disappointed" with a loss of 17% of their body weight. After 48 weeks of treatment, 47% of patients did not even achieve a weight they had defined as "disappointing."

These same measures were examined in a larger, more heterogeneous sample of treatment seeking obese individuals, and, on average, outcome evaluations were similar (Foster, Wadden, Phelan, Sarwer & Sanderson, 2001). Patients' dream weights, on average, required a weight loss of 34%, while a weight loss of 25% was considered "acceptable" and a weight loss of 16% was judged as "disappointing." It was concluded that patients have goals that are much higher than the actual losses they attain, and a large discrepancy exists between patients' expectations and professional recommendations for weight loss. This finding is not unusual, and

several studies have found the majority of weight loss treatment seeking patients wanting to lose between 22-34% of their initial body weight (Dalle Grave et al., 2004; Jeffery et al., 1998; O'Neil, Smith, Foster & Anderson, 2000; Wadden et al., 2003). In addition, treatment-seeking obese individuals place an even higher value on achieving goal weight than obese individuals who do not seek treatment. Both of these groups place a higher value on their goal weights than do non-obese individuals (O'Neil et al., 2000), perhaps because these individuals believe that only large weight losses will allow them to achieve significant improvements in attractiveness, self-confidence, and interpersonal relationships (Cooper & Fairburn, 2002). Given that the most successful non-surgical weight loss treatments only yield average losses of 9-12% (Wing, 2002), it is likely that most individuals will complete treatment having lost only one-third to one-half of what they had initially desired to lose, an outcome that they perceive as worse than disappointing. The consequences of this discrepancy between expected and actual weight losses have not been thoroughly examined, but may lead individuals to devalue the significance of modest weight reduction, possibly leading to disappointment, disillusionment, and abandonment of behaviors necessary to control weight, resulting in subsequent weight regain (Cooper & Fairburn, 2002).

In the weight loss literature, there is a debate regarding the potential impact of weight loss goals on subsequent weight loss. One school of thought is that unrealistic, high goals are detrimental to weight loss, satisfaction, subsequent maintenance, and overall psychological well-being. Research in the broader psychological literature showing that the pursuit of unattainable goals leads to

negative behavioral and psychological consequences is cited in support of this perspective (Carver & Scheier, 1990; Cervone et al., 1991; Higgins, 1987; Wicklund & Gollwitzer, 1982). It is believed that modest, more reasonable goals should be encouraged because this will reduce the discrepancy between actual and expected outcomes, and will lead to increased satisfaction, which will subsequently improve long-term outcomes (Ames et al., 2005; Foster et al., 2001; O'Neil et al., 2000; Wadden et al., 2003). On the other hand, some are skeptical that these unrealistic goals are actually harmful, and believe that larger goals, though unrealistic, may motivate larger losses and better outcomes (Jeffery et al., 1998; Linde et al., 2004; 2005). It is believed that this perspective is supported by broader psychological literature that claims that optimism, even when unrealistic, is a common, healthy, and adaptive human characteristic (Taylor & Brown, 1988; Scheier & Carver, 1992).

Before delving into empirical findings on both sides of this argument, it is worthwhile to consider the use of the term “unrealistic,” given its value-laden implications. The term “unrealistic” has been used extensively in this particular literature to describe the goals and expectations that individuals have for weight loss. Though there is no formal “cutoff” with which to designate a goal as unrealistic, weight losses of greater than 20% are considered unrealistic, given that these expectations are often double or triple the average weight change outcomes found in the best available treatments. Researchers may not agree on the effects of unrealistic goals on weight loss, but they do agree that a weight loss goal of 20% or more is unrealistic (Ames et al., 2005; Foster et al., 1997; Linde et al., 2004; Wadden et al.,

2003). It is not that these desired weight loss goals of 20% or more are physically impossible, as some patients are successful at losing such large amounts of weight. However, losing this much weight is the exception, not the rule in weight loss research, as less than 5% of patients actually reach their goal weights (Linde et al., 2005).

Those who believe that unrealistic goals are detrimental to weight loss and weight loss maintenance cite research that indicates that greater discrepancies between actual and expected weight losses are associated with dissatisfaction (Carver & Scheier 1982; 1990; Higgins, 1987; Sarason, 1975; Wicklund & Gollwitzer, 1982). It is believed that this dissatisfaction may negatively affect subsequent efforts to maintain weight losses. To decrease this discrepancy one can either (a) produce larger weight losses or (b) modify patients' expectations for weight loss. Efforts to produce larger weight losses have been largely unsuccessful, as most weight loss treatments produce similar results of approximately 9-12% of weight lost (Wing, 2002). The other alternative is to modify patients' expectations for weight loss in hopes of reducing the discrepancy between actual and expected outcomes. It has been argued that this will increase the likelihood of goal attainment and will lead to satisfaction, which will, in turn, positively affect long-term weight loss maintenance. Relevant studies have examined the relationship between weight loss goals, expectations, and outcomes, as well as the effects of modifying weight loss expectations on weight loss and weight loss maintenance.

It has been found that weight loss expectations at baseline predict attrition in obese patients in a weight loss program in Italy (Dalle Grave et al., 2005). The higher the expectations, the higher the rate of participant attrition at 12 months. In a similar study, weight loss expectations were examined in obese patients in a multi-center study (Dalle Grave et al., 2004). Likewise, it was found that expectations predicted treatment attrition; more specifically, the higher the expectations at baseline, the higher the rate of attrition at 12 months. Although not measured, a potential mediator is satisfaction with the outcomes of treatment. If patients were not satisfied with the outcome of their efforts, attrition may represent the abandonment of weight control efforts. These findings may support research indicating that unmet expectations may lead to disengagement from effort towards goals (Klinger, 1987).

Some recent studies have explored the effects of implementing interventions to modify weight loss expectations, based on the assumption that more realistic expectations will facilitate successful weight loss maintenance. Foster and colleagues (2004) conducted a pilot study on the effects of promoting modest weight losses. Seventeen women participating in a 40-week weight loss program were educated about the benefits of modest weight losses and the potential detriment of unrealistic expectations. Participants initially expected to lose, on average, 17.2% of their body weight by the end of treatment. Throughout treatment, they significantly reduced their expectations to 9.8%, however, their goals for weight loss remained unrealistically high (22-27%). Results indicate that promoting modest weight losses did not facilitate weight loss maintenance. However, greater satisfaction with body

weight at the end of treatment was associated with significantly better maintenance of weight loss.

Wadden and colleagues (2003) examined whether participants' expectations about weight loss would change after being advised of reasonable weight loss expectations. Prior to a year of weight loss treatment, 53 obese women were informed that they should expect to lose 5%-15% of their initial body weight. Despite this intervention, participants only modified their expectations moderately (from a 28% weight loss to a 25% weight loss). No relationship was found between expected weight losses and actual losses, however, individuals did report being moderately satisfied with their weight losses, despite the fact that their actual weight losses fell significantly short of their expectations for weight loss.

Ames and colleagues (2005) investigated the effects of an intervention designed to modify unrealistic expectations about weight loss and its impact on appearance, attractiveness, and self-esteem. After completing 10 sessions of standard behavioral weight loss treatment, 28 obese women were randomly assigned to 10 additional sessions of either standard behavioral treatment or reformulated cognitive-behavioral treatment (RCB). The RCB focused on establishing realistic goals and expectations for weight loss, modifying false beliefs regarding appearance, and encouraging acceptance of weight and body shape achieved at the end of treatment. The intervention successfully produced more realistic expectations, decreased participants' desire to lose weight as a means of increasing self-confidence, and improved overall self-esteem in the RCB group. However, contrary to hypotheses,

the intervention did not produce significantly better maintenance of weight loss at 6 months. Taken together, these interventions appear to be successful in modifying the unrealistic goals and expectations of obese individuals, but they have not yet shown a strong impact on short- or long-term weight loss. However, altering weight loss goals and expectations appears to have an impact on satisfaction with weight loss and overall self-esteem.

On the other side of the argument are those who question the assumption that high weight loss goals are detrimental; in fact, they posit that larger goals may actually motivate larger losses and better long-term outcomes (Jeffrey et al., 1998; Linde et al., 2005). This perspective is based on research from the broader literature, such as the positive relationship between goals and performance (Locke & Latham, 2002) and the positive effects of illusory optimism (Taylor, 1989). Relevant studies have examined the ways in which goals and expectations for weight loss affect weight loss and maintenance.

Some early studies have examined the ways in which weight loss goals and expectations affect weight loss outcomes. Kincey (1980) randomly assigned 58 obese females to two groups experimentally manipulated to have different expectations about the rate of weight loss over 16 weeks. Participants who were instructed to set unrealistically high goals lost significantly more weight at 14 weeks than those instructed to set realistic goals. It was concluded that goals that are unrealistically high may spur more effort than goals set at realistic levels. Kincey (1980) speculated that individuals respond differently based on the discrepancy between their expected

and actual outcomes; in this case, he implied that larger discrepancies fuel greater effort. This would support Carver and Scheier's (1982; 1990) assertion that individuals show continued effort toward their goals in an attempt to reduce the discrepancy between actual and expected outcomes.

Bradley, Poser, and Johnson (1980) investigated outcome expectations in 15 obese patients enrolled in a 7-week weight loss program. Outcome expectations were assessed by taking the number of pounds participants expected to lose and multiplying this value by the confidence rating they provided. It was found that participants' outcome expectancies may be predictive of actual outcome; expectations stated at baseline were significantly correlated with weight loss at 7 weeks, but expectations were much higher than actual weight lost. This study supports the theory that higher expectations will produce greater effort toward stated goals (Scheier & Carver, 1992).

Bonato and Boland (1987) assessed weekly and monthly weight loss goals in a group of 83 obese women participating in a 10-week behavioral weight control program. It was found that higher weight loss goals predicted weight loss, accounting for 12.5% of the variance. Greater initial weight loss and greater number of past weight loss attempts also predicted weight loss. Interestingly, these higher weight loss goals predicted weight loss during the treatment phase, but did not influence weight outcomes at 1-year follow up. Predictors of long-term weight loss included full-time employment outside of the home, later onset of obesity, and the ability to overcome urges to overeat. It was interpreted that positive expectations for weight loss have a

beneficial effect on weight loss, but only in the short-term. This study showed that predictors of treatment outcome are not the same as predictors of maintenance outcome, lending support to Rothman's (2000) hypothesis that there may be different processes operating in behavior change and behavior maintenance.

Oettingen and Wadden (1991) studied the impact of expectations and fantasies on weight loss in 25 obese women participating in a 1-year behavioral weight loss program. Goal weight and expectations of reaching this weight were assessed at baseline. In addition, participants engaged in a task designed to elicit fantasies regarding weight loss and encounters with tempting foods. They were asked to rate the positivity, negativity, and intensity of their responses to each scenario. Fantasies rated as negative often involved images of staying obese and failure to resist tempting foods, and fantasies rated as positive took the form of daydreams that weight loss would occur effortlessly. Both expectations and fantasies predicted weight loss, but in opposite directions. The more positive a participant's expectations about weight loss, the greater the amount of weight loss. The more positive a participant's fantasies about weight loss, the smaller the amount of weight loss. Interaction analyses indicated that participants with low expectations for weight loss and positive fantasies were less successful in losing weight than were those with negative fantasies. Weight loss was not affected by ratings of fantasies in participants with high expectations for weight loss. It was concluded that positive expectations are beneficial for weight loss, however positive fantasies have a negative effect on weight loss when they resemble wishful thinking that does not account for the effort

necessary for weight loss. This supports literature indicating that positive thinking has a beneficial effect on health and well being (Peterson, 2000; Taylor & Brown, 1988); however, positive thinking loses its benefit when it is in the form of unrealistic fantasies.

Jeffery, Wing, and Mayer (1998) explored the relationship between weight loss goals, initial weight lost, and long-term weight maintenance. One hundred thirty obese men and women participated in a 30-month weight loss study and reported the amount of weight loss they desired at baseline. Weight loss goals did not predict short-term weight loss, long-term weight loss, or long-term psychological outcomes. Participants who reached their weight loss goals showed better long-term weight losses, but this was largely due to differences in initial weight losses, which were positively related to weight loss at 30 months.

Linde, Jeffery, Finch, Ng, and Rothman (2004) examined the relationship between weight loss goals and weight loss outcomes in 302 obese women enrolled in a weight loss study. It was hypothesized that unrealistic goals for weight loss would be positively associated with history of weight control efforts and expected benefits and negatively associated with psychological well-being, effort, and success. No association was found between goals and weight outcomes at 8 weeks, 6 months, or 18 months. The only outcome to reach statistical significance was that higher dream weights were associated with greater weight loss at 18 months. Higher weight loss goals were associated with greater positive outcome expectations, greater expectations of behavior change, and greater use of specific weight loss strategies,

suggesting that individuals recognize that higher weight loss goals require greater effort. The authors concluded that weight loss goals, admittedly unrealistic, were slightly positively related to long-term weight loss success. The results of this study show some evidence for the positive relationship between goals and outcomes (Locke & Latham, 2002).

Linde, Jeffery, Levy, Pronk and Boyle (2005) prospectively investigated the relationship between weight loss goals, program participation, and weight loss over the course of 2 years. Obese participants ($N = 1801$) were asked how many pounds they expected to lose and how much they would like to weigh. Goal weights and ideal weights were unrealistically high in both men and women, with men wanting to lose an average of 19% and women wanting to lose an average of 27% of body weight. For women, higher goals were significantly associated with greater weight loss at 24 months. These results support that idea that higher goals motivate higher performance, rather than being detrimental to outcomes (Locke & Latham, 2002). Interestingly, although previous research has not yielded gender differences, in this study, men chose more realistic goal and ideal weights than women.

Finch and colleagues (2005) explored the effects of outcome expectancies and satisfaction on weight loss and weight loss maintenance in 349 obese adults whose expectations were experimentally manipulated. It was hypothesized that more favorable expectations of the outcomes of weight loss would lead to greater initial weight loss and that satisfaction with weight loss outcomes would predict long-term weight loss. Participants were randomly assigned to 2 treatment groups; the first

group was given an “optimistic message” that focused exclusively on the positive aspects of weight loss. The second group was given a “balanced message” that focused on both the positive and negative aspects of weight loss. The intervention was successful in affecting outcome expectations, but there were no significant differences between groups in weight change. It was found that, independent of treatment, more favorable expectations regarding weight loss were associated with better weight losses in the short-term, but not in the long-term. It should be noted that this particular study examined participants’ expectations regarding the ways in which losing weight would affect different aspects of their lives, as opposed to expectations of how much weight they would lose. Taken together, these studies demonstrate some evidence of the positive relationship between goals and performance (i.e., that higher weight loss goals and expectations may be associated with greater weight losses), but the relationships have not been robust.

So, do weight loss goals and expectations, realistic or unrealistic, have an impact on weight loss and weight loss maintenance? Higher weight loss expectations have been associated with higher levels of treatment attrition (Dalle Grave et al., 2004; 2005), but there is not strong evidence for the assumption that setting more realistic goals will lead to more successful weight loss. There is some evidence that higher weight loss expectations are associated with greater weight losses (Linde et al., 2004; 2005; Finch et al., 2005), but this finding has not been consistent or robust. The literature is clear that individuals set unrealistic goals for weight loss, but it has not yet been unequivocally demonstrated that realistic goals are beneficial for weight

loss or that unrealistic goals are detrimental to weight loss. A very limited number of studies have examined long-term outcomes, and research has not yet explored the goals and expectations that individuals set at the point at which they have lost weight and are seeking to maintain their weight losses.

Satisfaction and Weight Loss

As summarized previously, most individuals who enter weight loss programs desire to lose much more weight than is typical in such programs, and commonly do not meet their weight loss goals (Foster et al., 1997; Jeffery et al., 1998). They may experience dissatisfaction because of the discrepancy between their goals for weight loss and the weight loss they actually achieve (Brownell, 1991a; 1991b; Foster et al., 1997). Based on the broader literature that has examined the effects of unmet goals, dissatisfaction with outcomes may have an adverse effect on mood, self-esteem, self-efficacy, and body image (Bandura, 1986; Cervone et al., 1991; Cervone, Koppe, Schumann, & Scott, 1994). This may lead to various responses, such as unsuccessful and aggressive efforts to achieve the unmet goal (Bandura & Cervone, 1983; 1986; Locke & Latham, 2002), subsequent impaired effort toward the goal (Bandura & Cervone, 1983), or a permanent disengagement from the goal (Klinger, 1987). Unfortunately, if dissatisfaction with weight loss leads to increased efforts to lose weight, these efforts are unlikely to be successful. Research indicates that these patients do not lose additional weight after 6 months of treatment, even with continued treatment (Foster et al., 1997; Jeffery & Wing, 1995; Perri, Nezu, Patti & McCann, 1989). Taken together, these findings indicate that it is almost inevitable

that most patients will complete treatment feeling dissatisfied with their outcomes. Given the many negative effects of dissatisfaction in the broader psychological literature, it is important to further understand the impact of dissatisfaction on weight loss maintenance and psychological outcomes.

Only a few studies have examined the impact of satisfaction with weight loss on weight loss maintenance and psychological outcomes, and rarely has satisfaction been a hypothesized construct of interest. In a study examining the goals, expectations, and evaluations of obesity treatment in 60 women, it was found that despite losing considerably less weight than expected, participants reported that weight loss had significant positive physical and psychosocial effects (Foster et al., 1997). However, despite recognizing the positive effects of their weight losses, participants reported dissatisfaction with their weight at the end of treatment. It was found that the greater the discrepancy between participants' goals for weight loss and their actual weight losses, the lower their satisfaction with their end-of-treatment weight. This supports research positing that dissatisfaction is the result of a discrepancy between expected and actual outcomes (Carver & Scheier, 1990; Higgins, 1987; Locke & Latham, 2002).

As previously summarized, two studies intervened with participants in an attempt to modify weight loss goals and expectations to more realistic levels (Foster et al., 2004; Wadden et al., 2003). Both studies assessed participants' satisfaction with weight loss at various time points, and found relationships between satisfaction with weight loss, percentage of weight loss achieved, and weight loss maintenance.

Foster and colleagues (2004) found that higher satisfaction with body weight at the end of treatment was associated with significantly better maintenance of weight loss at follow up assessments. Wadden and colleagues (2003) found that the greater the percentage of expected weight loss achieved, the more satisfied participants reported to be at the end of treatment. Although participants in both of these studies continued to set unrealistically high goals for weight loss and fell short of achieving these goals, they did report being moderately satisfied with their weight losses. It is speculated that this may be a result of being repeatedly told what their realistic expectations for weight loss should be. Intervening to modify weight loss expectations may not affect actual weight losses, but it may facilitate satisfaction with moderate losses, which may subsequently lead to successful weight loss maintenance. Likewise, other studies have yielded correlational evidence for a relationship between satisfaction and weight loss maintenance (Head & Brookhart, 1997; Klem, McGuire, Seagle, & Hill, 1997). These findings lend support to the positive relationship between outcome and satisfaction (Hsee & Abelson, 1991; Locke & Latham, 2002).

In one of the few studies to closely examine the relationship between satisfaction, outcome expectations, and weight loss and maintenance, Finch and colleagues (2005) hypothesized that (a) satisfaction with weight loss outcomes would predict cumulative weight loss at follow up time points and (b) that unmet expectations would lead to dissatisfaction, and subsequently, less successful weight loss maintenance. Three hundred forty-nine adults were assigned to 1 of 2 weight loss groups that emphasized either (a) only the positive aspects of weight loss or (b)

both the positive and negative aspects of weight loss. No significant differences were found between treatment groups, but positive outcome expectations and satisfaction were both associated with weight loss. In addition, participants whose satisfaction increased over time also lost weight. These findings support the notion that higher expectations lead to better outcomes (Locke & Latham, 2002). There was no evidence for the hypothesis that higher expectations would lead to decreased satisfaction.

Taken together, there is some evidence that satisfaction with weight loss has a positive relationship with weight loss and maintenance (Finch et al., 2005; Foster et al., 2004; Head & Brookhart, 1997; Klem et al., 1997). There is mixed evidence on the hypothesis that higher goals and expectations lead to dissatisfaction. A few studies support the idea that a greater discrepancy between expected and actual weight losses leads to dissatisfaction (Foster et al., 1997; Wadden et al., 2003), but evidence to the contrary has also been found (Finch et al., 2005). At this point, the effect of satisfaction on weight loss maintenance has been established, but the relationship between the two is not well understood. Based on the broader literature, it can be speculated that satisfaction reinforces effort toward weight loss maintenance and keeps participants engaged in the behaviors necessary to maintain weight losses (Rothman, 2000). Dissatisfaction may impair performance by potentially interfering with cognitive processes that are critical to success, lead to depression and poor mood, and may subsequently lead to disengaging with the task at hand, ultimately leading to abandonment of weight loss maintenance efforts (Cervone et al., 1991).

Given the negative impact of dissatisfaction on weight loss and maintenance, further research is necessary to better understand the complex relationship between satisfaction and weight loss maintenance.

Measurement of Goals, Expectations, and Satisfaction with Weight Loss

Given the limited number of studies on goals and expectations for weight loss, there are only a few measures of these constructs. When assessing individuals' weight loss goals, many of these studies simply use one-item measures to assess goal weight in pounds at various time points (Foster et al., 2004; Jeffery et al., 1998; Linde et al., 2005; O'Neil, et al., 2000; Oettingen & Wadden, 1991; Wadden et al., 2003). Other studies have assessed weight loss goals by asking about the number of pounds an individual would like to lose at certain time points (Bonato & Boland, 1987; Bradley et al., 1980; Linde et al., 2005).

When assessing expectations for weight loss, participants are often asked how much weight they expect to lose at certain time points (Dalle Grave et al., 2004; 2005; Foster et al., 2004; Wadden et al., 2003). Expectations for reaching a stated goal weight have been assessed by rating the likelihood of losing the stated amount of weight and the confidence associated with the ability to lose this amount of weight (Linde et al., 2004; Oettingen & Wadden, 1991). Similarly, Bradley et al. (1980) calculated "outcome expectations" for weight loss by multiplying the number of pounds a respondent expects to lose by a confidence rating (between 0 and 100) of their expectation for weight loss. Beyond expectations for actual weight loss, one study (Finch et al., 2005) asked participants to rate how they expected weight loss to

affect different aspects of their lives related to personal characteristics, activities, relationship, and health.

In a study designed to explore obese patients' goals and expectations for weight loss, Foster and colleagues (1997) developed the Goals and Relative Weights Questionnaire (GRWQ). This measure assesses goal weight, the importance of factors in choosing this goal weight, and anticipated effects of weight loss on various factors (e.g., health, body image, stress). In addition, respondents are asked to numerically define (in pounds) four different weight loss outcomes: dream weight, happy weight, acceptable weight, and disappointed weight. Dream weight is "a weight you would choose if you could weigh whatever you wanted;" happy weight is a weight that is "not as ideal as the first one...it is a weight, however, that you would be happy to achieve;" acceptable weight is "a weight you would not be particularly happy with, but one that you could accept, since it is less than your current weight;" and disappointed weight is "a weight that is less than your current weight, but one that you could not view as successful in any way...you would be disappointed if this were your final weight." Respondents also rate how satisfied they would be with each of these weights.

The GRWQ has been used, in its original form or a slightly modified form, in several studies examining goals related to weight loss (Ames et al., 2005, Dalle Grave et al., 2004; 2005; Foster et al., 2001; 2004; Linde et al., 2004). It shows strong test-retest reliability for definitions of happy, acceptable, and disappointed weights (all r s $> .96$, all p s $< .0001$), but less so for dream weight ($r = .64$, $p < .001$). The GRWQ

was designed to measure goals and expectations for weight loss before and during weight loss treatment, but it does not measure goals and expectations for the weight loss maintenance phase.

Satisfaction with weight loss has typically been measured at various time points on a 10-point Likert scale ranging from very dissatisfied to very satisfied (Finch et al., 2005; Wadden et al., 2003). As described previously, the GRWQ assesses satisfaction on a 10-point Likert scale (Foster, et al., 1997; 2001; 2004). Satisfaction with weight loss has been assessed prior to (i.e. “How satisfied would you be with this weight?”) and following actual weight loss (i.e., “How satisfied are you with your total weight loss to date?”).

Goals, Expectations, and Satisfaction in the Treatment of Obesity

It is well established that there is a discrepancy between obese individuals’ goals and expectations for weight loss and their actual weight losses (Foster et al., 1997; 2001; Linde et al., 2005; Wadden et al., 2003). Research examining the potential relationship between weight loss goals and expectations and weight loss outcomes has yielded mixed results. It is apparent that the discrepancy between goal weights and actual weight losses leads to dissatisfaction with outcomes, and dissatisfaction may lead to withdrawal and disengagement from behaviors that are crucial to maintain weight losses. It is critical to delineate the complex relationships between weight loss goals, weight loss expectations, satisfaction with weight loss, and weight loss maintenance. A clearer understanding of these relationships will

guide future research and interventions and will potentially have a positive impact on weight loss maintenance

Limitations of Previous Research

Despite continued research on the factors associated with weight loss maintenance, most individuals who have successfully lost weight consistently regain it (Jeffery et al., 2000; Perri & Foreyt, 2004). Although much is known about the behaviors that are necessary to maintain weight losses, it is unclear why individuals choose to either engage or not engage in the behaviors critical for success. Therefore, much research is needed to better understand the psychological factors associated with weight loss maintenance. Given that there appears to be a fundamental difference between behavior initiation (i.e., weight loss) and behavior maintenance (i.e., weight loss maintenance), it is important to more closely examine the psychological processes occurring when individuals are attempting to maintain behavior change. To date, no studies have examined these processes at the crucial time point in which weight has been lost and individuals are entering a different phase of the change process.

Despite the fact that much research indicates that satisfaction with outcome is related to subsequent efforts toward goal attainment, the relationship between satisfaction with weight loss and maintenance of weight loss has not been extensively examined. Very few studies have examined the relationship between post-weight loss treatment satisfaction and weight regain. Given that satisfaction appears to impact subsequent efforts toward goal attainment, it is important to examine this relationship,

as well as the variables that may mediate the relationship between satisfaction and weight loss maintenance.

Although several studies have examined patients' goals and expectations for weight loss at the beginning of treatment, limited research has examined their goals and expectations when they have completed their treatment. It is important to examine goals and expectations at this phase, and the relationship between these constructs and longer term outcomes.

The Present Study

Taken together, these research findings suggest that psychological variables, specifically goals, expectations, and satisfaction, may influence individuals' success with maintaining weight losses following behavioral treatment of obesity. Further examination of these variables is needed to better understand their relationship to weight loss maintenance. The current study sought to evaluate effects of goals, expectations, and satisfaction on weight loss maintenance in individuals who completed a behavioral weight loss program. Findings could potentially clarify the complex relationships between these variables, and may guide interventions to facilitate successful weight loss maintenance. This randomized, prospective study was done with a clinical sample of individuals who were attempting to maintain weight loss.

HYPOTHESES

Primary Hypotheses

1. It was hypothesized that higher levels of satisfaction with weight, after the weight loss phase and prior to the weight loss maintenance phase, would significantly predict maintenance of weight lost at 2 and 4 months.
2. It was hypothesized that higher goals for maintaining weight would be significant predictors of weight regain at 2 and 4 months.
3. It was hypothesized that higher expectations for maintaining weight would significantly predict weight regain at 2 and 4 months.
4. It was hypothesized that lower goals, after the weight loss phase and prior to the weight loss maintenance phase, would significantly predict satisfaction with weight at 2 and 4 months.
5. It was hypothesized that lower expectations for maintaining weight, after the weight loss phase and prior to the weight loss maintenance phase, would significantly predict satisfaction with weight at 2 and 4 months.

Secondary Hypotheses

6. It was hypothesized that satisfaction with weight, after the weight loss phase and prior to the weight loss maintenance phase, would be a significant predictor of better dietary habits at 2 and 4 months.
7. It was hypothesized that satisfaction with weight, after the weight loss phase and prior to the weight loss maintenance phase, would be a significant predictor of better exercise habits at 2 and 4 months.

8. It was hypothesized that satisfaction with weight, after the weight loss phase and prior to the weight loss maintenance phase, would be a significant predictor of lower levels of depression at 2 and 4 months.
9. It was hypothesized that satisfaction with weight, after the weight loss phase and prior to the weight loss maintenance phase, would be a significant predictor of lower levels of trait anxiety at 2 and 4 months.
10. It was hypothesized that satisfaction with weight, after the weight loss phase and prior to the weight loss maintenance phase, would be a significant predictor of lower levels of state anxiety at 2 and 4 months.

METHOD

Research Design

This study employed a randomized, prospective design. This study was done in the context of a larger investigation that was examining the effects of a psychosocial intervention on weight loss maintenance. Analyses collapsed across experimental and control groups, and because the primary intervention did not have a significant effect, treatment group was not included as a covariate. Based on a power analysis using the statistical software program, Power and Precision (Borenstein, Rothstein, & Cohen, 2001), 60 participants were required to yield power of .80 with a small to medium effect size.

Participants

Participants were males and females, ages 22-68 years old, recruited from a variety of sources such as individuals who had recently completed a university-based weight loss program, referrals from providers of obesity treatment, and flyers posted in the community. For those recruited through the university-based program, participants completed a 3 month, 9 month, or 12 month weight loss treatment program. Participants recruited for this study reported losing an average of 32.65 pounds (14.84 kg) prior to study entry and were required to have lost at least 5% of their initial weight. As previously mentioned, in its definition of weight loss maintenance, the Institute of Medicine (1995) indicates that a reduction in body weight of 5% or greater is considered successful.

Measures

Demographic Information. Participants were asked to provide basic demographic information, such as sex, race, age, marital status, number of children in the household, education level, and annual income. General health history, current medications, tobacco use, and alcohol use were also assessed. Participants were asked to provide a detailed history of their weight loss, weight gain, and weight loss maintenance over the last 5 years. They were asked about their highest adult weight, lowest adult weight, ideal weight goal, and difficulties in controlling their weight. They were asked about their history of participation in weight loss treatment, amount of weight lost in their most recent weight loss attempt, and amount of weight regained from their most recent weight loss attempt.

Primary variables

Body weight and height. Participants were weighed twice to the closest tenth of a pound on an electronic scale without shoes or heavy clothing. The average of these two weights was used to determine body weight. Body weight was measured at baseline, 2 months, and 4 months. Height was measured at baseline and was used to calculate participants' BMI.

Goals and Relative Weights Questionnaire (GRWQ; Foster et al., 1997). The GRWQ was used to measure goals, expectations, and satisfaction related to weight loss, as well as effects of weight lost at baseline, 2 months, and 4 months. The GRWQ has been used in several studies to measure goals and expectations for weight loss, however it was designed to measure these constructs before and during weight

loss treatment. This measure was revised to appropriately measure these constructs for post-treatment assessment as well as goals, expectations and satisfaction related to weight maintenance. In addition, 3 versions of the measure were developed to measure goals, expectations, and satisfaction at baseline and follow-up time points. The GRWQ-B was used at baseline, the GRWQ-FUI was used at 2-month follow-up, and the GRWQ-FU2 was used at 4-month follow-up. The original version of the GRWQ has demonstrated strong test-retest reliability for definitions of happy, acceptable, and disappointed weights ($r_s > .96$) but less so for dream weight ($r = .64$).

Effects of weight loss. Part 1 of the GRWQ-B measured the participants' assessment of the effects of weight loss on several factors in their lives. Respondents were asked to rate the effects that weight loss has had on different aspects of their lives on a 10-point Likert scale ranging from *extremely negative* (1) to *extremely positive* (10). Various factors included health, body image, stress, and self-confidence.

Retrospective report of goals and expectations. Part II of the GRWQ-B asked respondents to retrospectively report their goals and expectations at the start their participation in their most recent weight loss program. They were asked to report (a) how much they weighed at the start of their most recent weight loss program; (b) their goal weight at that time; and (c) how much weight they expected to lose at that time. They were also asked to define four different weight loss outcomes: (a) dream weight (i.e., "A weight you would choose if you could weigh whatever you wanted); (b) happy weight (i.e., "This weight is not as ideal as the first one. However, it is a

weight that you would be happy to achieve); (c) acceptable weight (i.e., “A weight that you would not be particularly happy with, but one you could accept since it is less than your current weight”); and (d) disappointed weight (i.e., “A weight that is less than your current weight, but one that you would not view as successful in any way. You would be disappointed if this were your final weight after the program”). Participants were asked to define these weights as they would have defined them at the beginning of their most recent weight loss program. Percentages of body weight reduction required to reach each of these defined weights were then calculated based on responses. It should be noted that retrospective data were not part of primary analyses.

Satisfaction. Part III assessed their current weight, satisfaction with current weight, and perceived difficulty in maintaining this weight. Satisfaction was measured on a 10-point Likert scale ranging from *very dissatisfied* (1) to *very satisfied* (10). Perceived difficulty in maintaining weight was measured on a 10-point Likert scale ranging from *very difficult* (1) to *not at all difficult* (10). Respondents were then asked if they expected to lose weight, maintain weight, or gain weight in the next 2 months and in the next 4 months. If they expected to lose weight, they were asked to define how much weight they expected to lose in 2 months and in 4 months. If they expected to maintain their weight, they were asked to rate how likely it was that they will have maintained their weight in 2 months and in 4 months. The likelihood of weight maintenance was measured on a 10-point Likert scale ranging

from *not at all likely* (1) to *very likely* (10). If they expected to gain weight, they were asked to define how much weight they expected to gain in 2 months and in 4 months.

Current goals and expectations. Part IV of the GRWQ-B assessed participants' desire to continue to lose weight. If respondents indicated they would like to continue to lose weight, they were asked to again define four different weight loss outcomes: (a) dream weight; (b) happy weight; (c) acceptable weight; and (d) disappointed weight. For each weight, participants were asked to rate their satisfaction with the specific weight, their perceived difficulty in maintaining this weight, and the likelihood that they would be able to maintain the weight. These constructs were measured on 10-point Likert scales that were described previously.

The GRWQ-FU1 and FU2 assessed the same constructs as GRWQ-B, but expectations about weight loss, maintenance, and regain were assessed at different time points. The GRWQ-FU1 assessed how much weight participants expected to lose or maintain over the next 2 months. Participants were also asked if they expected to maintain their current weight, and if so, how likely it was that they will have maintained their current weight in 2 months. The GRWQ-FU2 assessed how much weight participants expected to lose or maintain over the next 6 months. Participants were also asked if they expected to maintain their current weight, and if so, how likely it was that they will have maintained their current weight in 6 months.

Secondary Measures

Brief Diet Assessment. (National Cancer Institute). This measure was used to assess dietary habits at baseline, 2 months, and 4 months. The assessment is a 6-item

questionnaire in which respondents report on their dietary habits and rate different components of their diet over the last month. For example, a serving of fruit is described and respondents were asked to report the number of servings of fruit they have eaten during the last 24 hours and to compare their fruit intake during the last 24 hours as “more,” “less,” or “about the same” as their fruit intake during the last month. Participants were asked to rate their diets as “high,” “medium,” or “low” in fat. Lastly, individuals were asked to report the number of times they ate at a fast food restaurant in the last week. The first 3 items were summed to provide a score for intake of fruit and vegetables and the last 2 items were summed to provide a score for intake of fatty foods.

International Physical Activity Questionnaire – Short Form (IPAQ-SF; International Consensus Group for the Development of an International Physical Activity Questionnaire, 2002 revised). The IPAQ was used to assess physical activity at baseline, 2 months, and 4 months. The IPAQ is a 7-item questionnaire that measures time spent in physical activity in the last 7 days. Participants were asked to report on the frequency with which they engaged in various activities over the past 7 days, as well as the amount of time typically spent on the activity on a given day. Activities included vigorous activities, moderate activities, walking, and sitting. The IPAQ has demonstrated good test-retest reliability ($r = .80$). Criterion validity has been determined by using an accelerometer over the course of 7 days and comparing the results against reported minutes of vigorous, moderate, walking, and sedentary behaviors ($r = .30$).

Center for Epidemiologic Studies of Depression Scale (CES-D; Radloff, 1977). The CES-D was used to measure symptoms of depression at baseline, 2 months, and 4 months. The CES-D is a 20-item questionnaire that assesses symptoms of depression over the past week. Participants were asked to rate the frequency with which they experienced depressive symptoms on a 4-point Likert scale ranging from “*rarely or none of the time (less than one day)*” to “*most or all of the time (5-7 days)*.” Scores are summed and can range from 0-60, with a score of 16 indicating that an individual is at increased risk for meeting the criteria for major depressive disorder. The CES-D was developed for use in the general population as opposed to psychiatric populations, and has been used extensively to measure depressive symptomology. The measure has strong internal consistency ($\alpha = .85$), split-half reliability ($r = .85$) and moderate test-retest reliability ($r = .45-.70$). The CES-D has been moderately correlated with the Hamilton Clinician’s Rating scale and the Raskin Rating scale ($r_s = .44-.54$). The following are an example of items from the CES-D: “*I thought my life had been a failure;*” “*I felt lonely;*” “*I had trouble keeping my mind on what I was doing.*”

State-Trait Anxiety Inventory (STAI; Spielberger, 1983). The STAI was used to measure state and trait anxiety at baseline, 2 months, and 4 months. The State Anxiety scale assesses an individual’s current state of anxiety and the Trait Anxiety scale assesses an individual’s general state of anxiety. Each scale is comprised of 20 items that are rated on a 4-point Likert scale. The State Anxiety scale asked individuals to rate each item based on their current feelings, and the scale ranges from

not at all (1) to *very much so* (4). The Trait Anxiety scale asked individuals to rate each item based on how they generally feel, and the scale ranges from *almost never* (1) to *almost always* (4). The STAI has been used extensively and shows good reliability and validity across a variety of populations. The State Anxiety scale shows good reliability (Cronbach's $\alpha = .83-.92$), as does the Trait Anxiety scale (Cronbach's $\alpha = .86-.92$). The following are examples of items from the State Anxiety scale: "*I am tense*;" "*I feel nervous*;" "*I am jittery*." The following are examples of items from the Trait Anxiety scale: "*I feel like a failure*;" "*I worry too much over something that really doesn't matter*;" "*I lack self-confidence*."

Procedure

The study was advertised to participants at weekly weight loss group meetings as they approached the end of their university-based weight loss program. Interested individuals were asked to provide their contact information, and they were contacted to schedule their first visit following completion of their treatment program. Flyers were also posted around the community recruiting individuals who had recently lost weight and were seeking to maintain their weight losses. In addition, providers of obesity treatment were asked to refer interested individuals.

At the first study visit, the study investigator thoroughly described the purpose and procedures of the study. Participants were informed that they were participating in a research study that was examining the various factors associated with weight loss maintenance. They were informed of the average time involved in the study, as well as the potential risks and benefits of their participation. It was strongly emphasized

that the information they provided for the study would be kept confidential. They were also informed that their participation was voluntary and that they had the right to withdraw from the study at any point. Upon completion of informed consent, participants were weighed, provided demographic information, and completed psychosocial questionnaires. Participants returned for follow up visits at 2 months and 4 months, and were weighed and completed psychosocial questionnaires. Upon completion of the study, participants were debriefed about the nature of the study.

Analytic Strategy

1. Descriptive statistics for the sample were calculated using baseline demographic information.
2. Control variables were identified by examining the bivariate correlations between demographic variables and change in body weight. Potential covariates included age, race, gender, education level, marital status, weight at baseline, and baseline levels of dependent variables (i.e., expectations, satisfaction, depression). Given that participants were recruited from different sources, groups were compared for equivalence and no significant differences were found.
3. A correlational matrix was constructed to determine the bivariate correlations between the covariates, the predictor variables (goals, expectations, and satisfaction) and the criterion variables (body weight change and satisfaction).

Primary Analyses

4. In order to test Hypothesis 1, that satisfaction with weight would be a significant predictor of successful weight loss maintenance, a change in score in the criterion variable (body weight) was calculated. Body weight at baseline was subtracted from body weight at 2- and 4-month assessments. Positive scores indicated weight gain and negative scores indicated weight loss. Multiple regression analyses were used to examine the relationship between satisfaction with weight at baseline and weight change at 2- and 4-month time points. Any identified control variables were entered to covary out the effects of any demographic predictors of weight change.
5. In order to test Hypothesis 2, that higher goals would be significant predictors of weight regain, regression analyses were used to examine the relationship between baseline goals and weight change at 2- and 4-month time points. Any identified control variables were entered to covary out the effects of any demographic predictors of weight change.
6. In order to test Hypothesis 3, that higher expectations would be significant predictors of weight regain, regression analyses were used to examine the relationship between baseline expectations and weight change at 2- and 4-month time points. Any identified control variables were entered to covary out the effects of any demographic predictors of weight change.
7. In order to test Hypothesis 4, that lower goals would predict satisfaction, regression analyses were used to examine the effects of goals for weight

maintenance on satisfaction at 2- and 4-month time points. Any identified control variables were entered to covary out the effects of any demographic predictors of weight change.

8. In order to test Hypothesis 5, that lower expectations would predict satisfaction, regression analyses were used to examine the effects of expectations for weight maintenance on satisfaction at 2- and 4-month time points. Any identified control variables were entered to covary out the effects of any demographic predictors of weight change.

Secondary Analyses

9. In order to test Hypothesis 6, that satisfaction would predict better dietary habits, regression analyses were used to examine the relationship between satisfaction at baseline and dietary habits at 2- and 4-month time points.
10. In order to test Hypothesis 7, that satisfaction would predict better exercise habits, regression analyses were used to examine the relationship between satisfaction at baseline and exercise habits at 2- and 4-month time points.
11. In order to test Hypothesis 8, that satisfaction would predict lower levels of depression, regression analyses were used to examine the relationship between satisfaction at baseline and depression at 2- and 4- month time points.
12. In order to test Hypothesis 9, that satisfaction would predict lower levels of trait anxiety, regression analyses were used to examine the relationship

between satisfaction at baseline and trait anxiety at 2- and 4- month time points.

13. In order to test Hypothesis 10, that satisfaction would predict lower levels of state anxiety, regression analyses were used to examine the relationship between satisfaction at baseline and state anxiety at 2- and 4- month time points.

RESULTS

Data Screening

Data were entered and analyzed using Statistical Package for the Social Sciences (SPSS), Version 16.0 (SPSS, Inc., 2007). Validity checks were performed on a random sample of 25% of participants to ensure accuracy of data entry. Data from the initial sample of 68 participants were screened to identify missing data, invalid data, and subjects lost at follow-up assessments. Of the 68 participants, 55 had complete data. Nine participants (13.4%) were lost to attrition before the 2-month follow up visit and 1 participant missed the 2-month follow up visit but returned for the 4-month visit. In a few cases, despite attending study visits and having most data collected, 3 participants had partial lost data. One participant was removed from the sample because data for primary measures (i.e., goals, expectations, and satisfaction) from each time point were lost. Another participant was missing data for primary measures (i.e., goals, expectations, and satisfaction) at baseline and an additional participant was missing data for primary measures from the 2-month follow up visit. For participants who dropped out of the study or had missing data, data collected prior to drop out were included in analyses (see Table 1 for reasons for dropout), thus, the final sample of participants whose data were analyzed included 67 individuals. In addition, participants who completed the study were compared to participants lost to attrition on all variables, however no significant differences were found. Outlying scores were also identified, defined as any standardized z-score greater than 3.29 (Tabachnick & Fidell, 2001). Data that met

this criterion were also examined through a visual data inspection using histograms. Using both z-score cut-offs and histogram examination, 2 weight change outcomes for 1 participant were eliminated, given an unusually high pattern of weight change compared to other participants.

Table 1

Reasons for attrition

Stated reasons for dropping out of the study	<i>n</i>	Visits completed
Difficulty with medical center parking	3	Baseline
Study differed from expectations	2	Baseline
Too busy to complete study	2	Baseline
Writing was distressing	1	Baseline
No explanation	1	Baseline

Distributions on all variables were then evaluated to test for the assumption of normality. Inspection of histograms, and calculation of skewness and kurtosis were used to assess normality of variables. Violations of normality were detected in the distributions of satisfaction with current weight and expectations for weight loss maintenance. Log 10, square root, natural logarithm, inverse, and natural transformations were performed and skewness, kurtosis, and histograms were re-

inspected to determine which transformation procedure produced the most normal distribution (Tabachnick & Fidell, 2001), however none of the transformations improved the data distributions on satisfaction or expectations for weight loss maintenance. This was likely due to the study's small sample size. It was determined to perform statistical analyses on the original data, given data transformation procedures provided little to no benefit. However, results should be interpreted with caution, given these variables (e.g., satisfaction and expectations for weight loss maintenance) were not normally distributed. While certain descriptive characteristics of satisfaction ($M = 4.52$, $SD = 2.85$) were consistent with a previous study that used the same measure (Foster et al., 1997), the distribution was somewhat positively skewed, with a number of participants reporting very low satisfaction with their weight. See Table 2 for means, standard deviations, and ranges for satisfaction. Regarding expectations for weight loss maintenance, no previous studies measured this construct, so it is difficult to determine if the descriptive characteristics of the current sample were non normal. Test-retest reliability for satisfaction with current weight was adequate ($r = .52-.67$), however this was not measured for goals and expectations because the wording of these measures varied at each time point.

Table 2

Descriptive statistics for primary variables

Variable	Mean (SD)	Range
Satisfaction	4.53 (2.85)	1-10
Goals for weight loss	18.37 (11.12) lbs 8.35 (5.00) kgs	0 - 50 lbs 0 - 22.72 kgs
Expectations for weight maintenance	3.41 (4.09)	1-10
Weight Change at 2 months	.94 (4.96) lbs .43 (2.25) kgs	-8.50 - +11.39 lbs -3.86 - +5.18 kgs
Weight Change at 4 months	3.85 (7.43) lbs 1.75 (3.38) kgs	-13.20 - +22.10 lbs -6.00 - +10.05 kgs

Regarding missing data, data imputation methods were considered, but it was ultimately determined that missing data would be treated as such. Data imputation methods were deemed less than ideal because of the potential for biasing results. Given the primary outcome variable was weight change over time, it is likely that data imputation would have biased the results in favor of the study's hypotheses. The weight loss maintenance literature has consistently documented that individuals tend to gain weight over time (Jeffery et al., 2000; Perri & Corsica, 2002), and various methods of data imputation (e.g., carrying values forward or using the means of

previous values) would likely have shown less accurate changes in weight, specifically, less weight gain than what would have likely occurred.

Descriptive Characteristics

Descriptive statistics were calculated based on responses collected from all study participants in the demographic questionnaire completed at the baseline visit. Participants ranged in age from 22-68, with an overall mean of 47 years old. Eighty-eight percent of the participants were Caucasian, 76.1% were female, 73.1% were married or living with someone as if married, 82.1% had a college degree or higher, and 61.2% had an annual income of \$50,000 or greater. Sample characteristics are presented in Table 3.

Table 3

Characteristics of sample

Demographics	<i>n</i>	%	Mean (SD)
<u>Age</u>			46.94 (10.01)
<u>Sex</u>			
Female	51	76.1%	
Male	16	23.9%	
<u>Race</u>			
Caucasian	59	88.1%	
Black	3	4.5%	
Asian	1	1.5%	
Latino	2	3.0%	
Pacific Islander/Alaskan Native	1	1.5%	
Other	1	1.5%	
<u>Marital Status</u>			
Married	49	73.1%	
Divorced	7	10.4%	
Single	10	14.9%	
Separated	0	0%	
Widowed	1	1.5%	
<u>Education</u>			
Some college	12	17.9%	
College degree	30	44.8%	
Master's degree	17	25.4%	
Doctoral degree	8	11.9%	
<u>Annual Income</u>			
< \$35,000	13	19.4%	
\$35,000-\$49,999	12	17.9%	
\$50,000-\$75,000	16	23.9%	
Over \$75,000	25	37.3%	
Did not answer	1	1.5%	

Table 4 presents the various forms of weight loss treatment that participants engaged in prior to their involvement in the current study. The majority of participants completed structured behavioral weight loss interventions provided within the context of a university-based weight loss program (77.7%), with length of treatment lasting from 3 to 6 months for 88.2% of participants. Over 80% of participants participated in group weight loss interventions. One participant lost weight using a surgical approach to weight loss (i.e., gastric bypass surgery). While this method of weight loss is markedly different than behavioral approaches, this participant's data was included in analyses because there did not appear to be differences in baseline characteristics, as compared to the rest of the sample. Participants reported losing an average of 32.65 pounds (14.84 kg). It should be noted that a handful of participants reported losing over 65 pounds, and that the modal weight loss reported was 20 pounds. Additionally, participants provided information about their general health history and health behaviors. When asked to rate their general health in the last year, participants reported an average of 4.82 (0 = very poor; 6 = excellent). Participants reported taking an average of 4 medications and an average of 3 lifetime health conditions.

Table 4

Weight loss intervention characteristics

Weight loss intervention characteristics	<i>n</i>	%	Mean (SD)	Range
<u>Mode of Delivery</u>				
Group	51	76.1%		
Individual	9	13.4%		
Telehealth	3	4.5%		
Phone Group	3	4.5%		
Surgical	1	1.5%		
<u>Length of Intervention</u>				
3 months	30	44.1%		
6 months	14	20.6%		
9 months	15	23.5%		
12 months	6	8.8%		
24 months	2	2.9%		
Weight Loss			32.65 (17.47) lbs 14.84 (7.94) kgs	10.0 – 90.0 lbs 4.5 - 40.9 kgs
Weeks since completing intervention			3.06 (1.82)	1 - 10

GRWQ and Weight Characteristics

Participants had an average weight of 196.60 pounds ($SD = 50.60$) and BMI of 31.28 (in the obese range; $SD = 7.19$). On average, participants rated the impact of their weight loss on 19 physical and psychosocial factors (e.g., health, stress, body image, etc) as somewhat positive ($M = 6.95$, $SD = 1.37$) and reported that they were, on average, neither satisfied nor dissatisfied with their current weight ($M = 4.53$, $SD = 2.85$). Specifically, only 4.5% of participants rated themselves as “very satisfied” with their current weight, while 22.4% rated themselves as “very dissatisfied” with their current weight. Participants reported that it was somewhat difficult to maintain their current weight ($M = 6.12$, $SD = 2.19$). See Table 2 for means, standard deviations, and ranges for satisfaction.

Despite having lost at least 5% of their body weight prior to entering this study, 94% of participants still desired to lose weight and 80.6% of participants expected to continue to lose weight. On average, participants wanted to lose another 5% of their body weight over the next 2 months and another 9% of their body weight over the next 4 months. Forty percent of participants expected to maintain their current weight and on average, felt it was fairly likely that they would maintain their current weight over the next 2 months ($M = 7.46$, $SD = 2.56$) and fairly unlikely that they would maintain their current weight over the next 4 months ($M = 3.41$, $SD = 4.09$). Only 6% of participants expected to gain weight, anticipating that they would gain, on average, 5 pounds over the next 2 months and 7 pounds over next 4 months. In contrast, over the next 4 months, 66% of participants who completed the study

gained between <1 pound to 22 pounds ($M = 7.79$, $SD = 5.39$). Thirty-two percent of participants lost between <1 pound to 13 pounds ($M = 4.03$, $SD = 4.08$). Less than 2% of participants maintained their weight by the final visit. See Table 2 for means, standard deviations, and ranges for goals and expectations.

Participants were asked to define their “dream weight,” “happy weight,” “acceptable weight,” and “disappointed weight.” A percentage was calculated to determine the percent of weight needed to lose to reach each of these defined weights. Table 5 displays averages for each defined weight, as well as participants’ perceived satisfaction with this weight, difficulty maintaining this weight, and likelihood of maintaining this weight on scales of 1-10. On average, participants selected “dream weights” that required an additional 24% loss of their current body weight. They reported that they would be very satisfied with these weights, however recognized that these weights would be very difficult and somewhat unlikely to maintain. On average, participants chose “happy weights” that required a 16% loss of their current weight. They anticipated that they would be somewhat satisfied with these weights, and that these weights would be somewhat difficult to maintain and somewhat likely to maintain. Participants selected “acceptable weights” that required a 10% loss of their current weight. They reported that they would be somewhat satisfied with these weights, and that these weights would not be very difficult to maintain and that it was somewhat likely they would maintain this weight. Lastly, participants chose “disappointed weights” that required a 4% loss of their current weight. They reported

they would be somewhat dissatisfied with this weight and that this weight would not be very difficult to maintain and that they were pretty likely to maintain this weight.

Table 5

Defined weights and associated ratings at baseline

Variable	% Weight needed to lose Mean (SD)	Satisfaction with this weight Mean (SD)	Difficulty maintaining Mean (SD)	Likelihood of maintaining Mean (SD)
Dream Weight	23.75% (12.76)	9.70 (0.61)	3.13 (2.46)	4.06 (2.49)
Happy Weight	16.34% (10.00)	8.48 (1.59)	4.81 (2.21)	5.37 (2.08)
Acceptable Weight	10.19% (7.76)	6.22 (1.94)	6.83 (1.82)	6.35 (1.99)
Disappointed Weight	3.61% (6.46)	3.56 (2.22)	7.17 (2.04)	7.46 (2.04)

Correlations Between Potential Control Variables and Criterion Variables

Prior to analyses, a change score in the criterion variable, weight, was calculated by subtracting baseline weight from 2 month and 4 month weight. Positive scores indicated weight gain and negative scores indicated weight loss. Bivariate correlations were conducted between hypothesized control variables and weight change to determine whether control variables needed to be included in regression analyses. Bivariate correlations were also conducted between hypothesized control variables and satisfaction with weight. Hypothesized control variables included age, race, gender, education level, marital status, income, weight at baseline, and baseline

levels of criterion variables (e.g., satisfaction, depression, anxiety, diet habits). As reflected in Table 6, only baseline levels of criterion variables were significantly correlated with weight change. Similarly, only baseline levels of criterion variables were significantly correlated with satisfaction with weight (See Table 7). In addition, bivariate correlations were conducted between treatment variables (e.g., study intervention group, type of weight loss treatment, length of weight loss treatment, form of weight loss treatment delivery, weeks since completing weight loss treatment, and study location) and criterion variables, but none of these correlations were significant. Variables that correlated significantly with weight change and satisfaction were included as covariates in subsequent regression analyses.

Table 6

Correlations between potential covariates and weight change

Covariate	Weight Change at 2 months	Weight Change at 4 months
Age	-.04	-.11
Race	-.07	-.08
Gender	.11	.20
Education Level	.06	.03
Marital Status	.20	.11
Income	.05	-.06
Weight at Baseline	.27*	.43**
Satisfaction at (Baseline)	-.06	.01
Depression (Baseline)	.23	.30*
Trait Anxiety (Baseline)	.12	.27*
State Anxiety (Baseline)	.16	.20
Fruit/Vegetable Intake (Baseline)	-.08	-.22
Fatty Food Intake (Baseline)	.02	-.03

* $p < .05$ ** $p < .01$

Table 7

Correlations between potential covariates and satisfaction

Covariate	Satisfaction at 2 months	Satisfaction at 4 months
Age	.00	-.02
Race	.18	.20
Gender	.09	.10
Education Level	-.11	.00
Marital Status	.12	-.04
Income	.01	-.08
Weight (Baseline)	-.45**	-.33*
Satisfaction (Baseline)	.67**	.52**
Depression (Baseline)	-.23	-.18
Trait Anxiety (Baseline)	-.39**	-.25
State Anxiety (Baseline)	-.18	-.10
Fruit/Vegetable Intake (Baseline)	.47**	.38**
Fatty Food Intake (Baseline)	-.30*	-.27*

* $p < .05$ ** $p < .01$

A correlational matrix of predictor and criterion variables was constructed to determine whether multicollinearity or singularity between variables occurred. Significant bivariate correlations between predictor and criterion variables (shown in Table 8) ranged from $r = -.41$ to $.58$. While correlations between $-.41$ and $.58$ were statistically significant, correlations less than $.70$ do not typically create problems of multicollinearity or singularity (Tabachnick & Fidell, 2001). It should be noted that a few correlations between the same variables at different time points (e.g., satisfaction at baseline, 2 months, and 4 months) were highly correlated, as would be expected, and this does not contribute to problems with multicollinearity or singularity.

Table 8

Correlational Matrix of Predictor and Criterion Variables

Variables	SAT	GLS	EXP	WΔ2	WΔ4	SAT2	SAT4
Satisfaction (SAT)	--	-.35*	.58**	-.06	-.01	.67**	.52**
Goals (GLS)		--	-.23	.18	.19	-.31*	-.41**
Expectations (EXP)			--	-.06	-.16	.41**	.36*
Weight Change (WΔ2 mos)				--	.79**	-.14	-.28*
Weight Change (WΔ4 mos)					--	-.28*	-.35**
Satisfaction (SAT2 mos)						--	.77**
Satisfaction (SAT4 mos)							--

* $p < .05$ ** $p < .01$

Primary Analyses

Satisfaction and Weight Change. In order to test Hypothesis 1, that satisfaction with weight at baseline would predict weight change at 2 and 4 months, a simultaneous multiple regression analysis was performed to analyze the contribution of predictor variables on weight change. Satisfaction with weight at baseline and baseline weight were entered as predictor variables and weight change at 2 months was entered as the criterion variable. The model was not significant at 2 months [$F(2, 62) = 2.28, p = .11$]. Another multiple regression analysis was conducted to examine the same variables at 4 months, covarying, in addition, for trait anxiety at baseline and depression at baseline. The model was significant [$R^2 = .28, \text{adjusted } R^2 = .22, F(4, 50) = 4.6, p = .002$], and weight change at 4 months was significantly and uniquely predicted by baseline weight [$\beta = .50, t(50) = 3.55, p < .01, r_{\text{partial}} = .45$].

Satisfaction with weight at baseline, trait anxiety and depression at baseline were not significant predictors of weight change at 4 months. Contrary to hypotheses, satisfaction with weight at baseline did not predict weight change over time.

Goals and Weight Change. In order to test Hypothesis 2, that goals at baseline would predict weight change at 2 and 4 months, a simultaneous multiple regression analysis was performed to analyze the contribution of predictor variables on weight change. Goals at baseline and baseline weight were entered as predictor variables and weight change at 2 months was entered as the criterion variable. The model was not significant at 2 months [$F(2, 48) = 1.93, p = .16$]. Another multiple regression analysis was conducted to examine the same variables at 4 months, covarying, in addition, for trait anxiety at baseline and depression at baseline. The model was significant [$R^2 = .32, \text{adjusted } R^2 = .25, F(4, 41) = 4.71, p = .003$] and weight change at 4 months was significantly and uniquely predicted by baseline weight [$\beta = .42, t(41) = 2.92, p < .01, r_{\text{partial}} = .42$]. Goals at baseline, trait anxiety at baseline, and depression at baseline were not significant predictors of weight change at 4 months. Contrary to hypotheses, goals at baseline did not predict weight change over time.

Expectations and Weight Change. In order to test Hypothesis 3, that expectations at baseline would predict weight change at 2 and 4 months, a simultaneous multiple regression analysis was performed to analyze the contribution of predictor variables on weight change. Expectations at baseline and baseline weight were entered as predictor variables and weight change at 2 months was entered as the

criterion variable. The model was not significant at 2 months [$F(2, 54) = 1.85, p = .17$]. Another multiple regression analysis was conducted to examine the same variables at 4 months, covarying, in addition, for trait anxiety at baseline and depression at baseline. The model was significant [$R^2 = .30, \text{adjusted } R^2 = .24, F(4, 44) = 4.81, p = .003$], and weight change at 4 months was significantly and uniquely predicted by baseline weight [$\beta = .42, t(44) = 3.01, p < .01, r_{\text{partial}} = .41$].

Expectations at baseline, trait anxiety at baseline, and depression at baseline were not significant predictors of weight change at 4 months. Contrary to hypotheses, expectations at baseline did not predict weight change over time.

Goals and Satisfaction. In order to test Hypothesis 4, that goals at baseline would predict satisfaction at 2 and 4 months, a simultaneous multiple regression analysis was performed to analyze the contribution of predictor variables on satisfaction. Goals at baseline, baseline weight, satisfaction at baseline, trait anxiety at baseline, fruit and vegetable intake at baseline, and fatty food intake were entered as predictor variables and satisfaction at 2 months was entered as the criterion variable. The model was significant [$R^2 = .66, \text{adjusted } R^2 = .60, F(6, 37) = 11.76, p = .000$], and satisfaction at 2 months was significantly and uniquely predicted by baseline weight ($\beta = -.38, t(37) = -3.46, p < .01, r_{\text{partial}} = -.50$), followed by satisfaction with weight at baseline [$\beta = .35, t(37) = 2.96, p < .01, r_{\text{partial}} = .44$], fruit and vegetable intake [$\beta = .32, t(37) = 3.01, p < .01, r_{\text{partial}} = .44$], and fatty food intake [$\beta = -.22, t(37) = -2.07, p < .05, r_{\text{partial}} = -.32$]. Goals at baseline and trait anxiety were not significant predictors of satisfaction at 2 months. Another multiple regression

analysis was conducted to examine the same variables at 4 months, with the exception of trait anxiety at baseline. The model was significant [$R^2 = .37$, adjusted $R^2 = .29$, $F(5, 40) = 4.63$, $p = .002$], however none of the predictors were significant predictors of satisfaction at 4 months. Only the fruit and vegetable intake approached significance [$\beta = .25$, $t(40) = 1.79$, $p < .10$, $r_{\text{partial}} = .27$]. Contrary to hypotheses, goals at baseline did not predict satisfaction with weight over time.

Expectations and Satisfaction. In order to test Hypothesis 5, that expectations at baseline would predict satisfaction at 2 and 4 months, a simultaneous multiple regression analysis was performed to analyze the contribution of predictor variables on satisfaction. Expectations at baseline, baseline weight, satisfaction at baseline, trait anxiety at baseline, fruit and vegetable intake at baseline, and fatty food intake at baseline, were entered as predictor variables and satisfaction at 2 months was entered at the criterion variable. The model was significant [$R^2 = .66$, adjusted $R^2 = .61$, $F(6, 41) = 13.17$, $p = .000$], and satisfaction at 2 months was significantly and uniquely predicted by satisfaction at baseline [$\beta = .40$, $t(41) = 3.32$, $p < .01$, $r_{\text{partial}} = .46$], followed by baseline weight [$\beta = -.30$, $t(42) = -2.99$, $p < .01$, $r_{\text{partial}} = -.42$], fruit and vegetable intake [$\beta = .30$, $t(41) = 2.79$, $p < .01$, $r_{\text{partial}} = .40$], fatty food intake [$\beta = -.22$, $t(41) = -2.26$, $p < .05$, $r_{\text{partial}} = -.33$]. Expectations at baseline and trait anxiety at baseline were not significant predictors of satisfaction at 2 months. Another multiple regression analysis was conducted to examine the same variables at 4 months, covarying for the same variables, with the exception of trait anxiety at baseline. The model was significant [$R^2 = .37$, adjusted $R^2 = .30$, $F(5, 44) = 5.14$, $p = .001$], however

only satisfaction at baseline approached significance as a predictor of satisfaction at 4 months [$\beta = .28, t(44) = 1.86, p < .10, r_{\text{partial}} = .27$]. Contrary to hypotheses, expectations at baseline did not predict satisfaction with weight over time.

Secondary Analyses

Satisfaction and Dietary Habits. In order to test Hypothesis 6, that satisfaction at baseline would predict dietary habits, a simultaneous multiple regression analysis was performed to analyze the contribution of predictor variables on dietary habits. Dietary habits consist of 2 scores, one for fruit and vegetable intake and one for fatty food intake. Satisfaction at baseline and fruit and vegetable intake at baseline were entered as predictor variables and fruit and vegetable intake at 2 months was entered as the criterion variable. The model was not significant at 2 months [$F(2, 53) = .69, p = .51$] or 4 months [$F(2, 54) = 1.83, p = .17$]. Another multiple regression analysis was performed to analyze the contribution of predictor variables on fatty food intake. Satisfaction at baseline and fatty food intake at baseline were entered as predictor variables and fatty food intake at 2 months was entered as the criterion variable. The model was significant [$R^2 = .30, \text{adjusted } R^2 = .28, F(2, 53) = 11.58, p = .000$], and fatty food intake at 2 months was significantly and uniquely predicted by fatty food intake at baseline [$\beta = .50, t(53) = 4.16, p < .01, r_{\text{partial}} = .50$]. Satisfaction at baseline was not a significant predictor of fatty food intake at 2 months. Another multiple regression analysis was conducted to examine the relationship between these variables and the model was significant [$R^2 = .23, \text{adjusted } R^2 = .21, F(2, 54) = 11.58, p = .001$], with fatty food intake at 4 months

significantly and uniquely predicted by fatty food intake at baseline [$\beta = .41, t(54) = 3.33, p < .01, r_{\text{partial}} = .45$]. Again, satisfaction at baseline was not a significant predictor of fatty food intake at 4 months. Contrary to hypotheses, satisfaction with weight at baseline did not predict dietary habits over time, specifically fruit and vegetable intake or fatty food intake.

Satisfaction and Exercise Habits. In order to test Hypothesis 7, that satisfaction at baseline would predict exercise habits, a simultaneous multiple regression analysis regression was performed to analyze the contribution of predictor variables on exercise habits. Satisfaction at baseline and exercise habits at baseline were entered as predictor variables and exercise habits at 2 months was entered as the criterion variable. The model was significant [$R^2 = .41, \text{adjusted } R^2 = .38, F(2, 42) = 14.30, p = .000$] and exercise habits at 2 months were significantly and uniquely predicted by exercise habits at baseline [$\beta = .64, t(42) = 5.34, p < .01, r_{\text{partial}} = .63$]. Satisfaction with weight at baseline was not a significant predictor of exercise habits at 2 months. Another multiple regression analysis was conducted to examine the same variables at 4 months, and the model was significant [$R^2 = .39, \text{adjusted } R^2 = .36, F(2, 43) = 13.77, p = .000$], with exercise habits at 4 months significantly and uniquely predicted by exercise habits at baseline [$\beta = .63, t(43) = 5.19, p < .01, r_{\text{partial}} = .62$]. Satisfaction at baseline was not a significant predictor of exercise habits at 4 months. Contrary to hypotheses, satisfaction with weight at baseline did not significantly predict exercise habits over time.

Satisfaction and Depression. In order to test Hypothesis 8, that satisfaction at baseline would predict depression, a simultaneous multiple regression analysis regression was performed to analyze the contribution of predictor variables on depression. Satisfaction at baseline and depression at baseline were entered as predictor variables and depression at 2 months was entered as the criterion variable. The model was significant [$R^2 = .32$, adjusted $R^2 = .29$, $F(2, 53) = 12.30$, $p = .000$] and depression at 2 months was significantly and uniquely predicted by depression at baseline [$\beta = .52$, $t(53) = 4.32$, $p < .001$, $r_{\text{partial}} = .51$]. Satisfaction with weight at baseline was not a significant predictor of depression at 2 months. Another multiple regression analysis was conducted to examine the same variables at 4 months, and the model was significant [$R^2 = .38$, adjusted $R^2 = .36$, $F(2, 54) = 16.41$, $p = .000$], with depression at 4 months significantly and uniquely predicted by depression at baseline [$\beta = .58$, $t(54) = 5.12$, $p < .001$, $r_{\text{partial}} = .61$]. Satisfaction at baseline was not a significant predictor of depression at 4 months. Contrary to hypotheses, satisfaction with weight at baseline did not significantly predict depression over time.

Satisfaction and Trait Anxiety. In order to test Hypothesis 9, that satisfaction at baseline would predict trait anxiety, a simultaneous multiple regression analysis regression was performed to analyze the contribution of predictor variables on trait anxiety. Satisfaction at baseline and trait anxiety at baseline were entered as predictor variables and trait anxiety at 2 months was entered as the criterion variable. The model was significant [$R^2 = .75$, adjusted $R^2 = .74$, $F(2, 53) = 79.88$, $p = .000$] and trait anxiety at 2 months was significantly and uniquely predicted by trait anxiety at

baseline [$\beta = .89, t(53) = 12.03, p < .001, r_{\text{partial}} = .86$]. Satisfaction with weight at baseline was not a significant predictor of trait anxiety at 2 months. Another multiple regression analysis was conducted to examine the same variables at 4 months, and the model was significant [$R^2 = .55, \text{adjusted } R^2 = .53, F(2, 53) = 32.10, p = .000$], with trait anxiety at 4 months significantly and uniquely predicted by trait anxiety at baseline [$\beta = .77, t(53) = 7.77, p < .001, r_{\text{partial}} = .73$]. Satisfaction at baseline was not a significant predictor of trait anxiety at 4 months. Contrary to hypotheses, satisfaction with weight at baseline did not significantly predict trait anxiety over time.

Satisfaction and State Anxiety. In order to test Hypothesis 10, that satisfaction at baseline would predict state anxiety, a simultaneous multiple regression analysis regression was performed to analyze the contribution of predictor variables on state anxiety. Satisfaction at baseline, as well as state anxiety at baseline, were entered as predictor variables and state anxiety at 2 months was entered as the criterion variable. The model was significant [$R^2 = .24, \text{adjusted } R^2 = .21, F(2, 53) = 8.50, p = .001$] and state anxiety at 2 months was significantly and uniquely predicted by state anxiety at baseline [$\beta = .44, t(53) = 3.58, p < .01, r_{\text{partial}} = .44$]. Satisfaction with weight at baseline was not a significant predictor of state anxiety at 2 months. Another multiple regression analysis was conducted to examine the same variables at 4 months, and the model was significant [$R^2 = .23, \text{adjusted } R^2 = .20, F(2, 54) = 7.85, p = .001$], with state anxiety at 4 months significantly and uniquely predicted by state anxiety at baseline [$\beta = .39, t(54) = 3.19, p < .01, r_{\text{partial}} = .40$]. Satisfaction at

baseline was not a significant predictor of state anxiety at 4 months. Contrary to hypotheses, satisfaction with weight at baseline did not significantly predict state anxiety over time.

DISCUSSION

The purpose of this study was to develop a better understanding of the psychological factors involved in successful weight loss maintenance, specifically the impact of satisfaction, goals, and expectations on weight change. This study was guided by Rothman's (2000) theory that the psychological processes that facilitate behavior change differ from the processes that facilitate maintenance of behavior change. While many studies have examined goals and expectations prior to weight loss treatment, the present study was one of the first investigations of these factors following weight loss treatment when individuals are transitioning to the weight loss maintenance phase. This was also one of the first studies to examine the impact of satisfaction with weight loss on weight loss maintenance. The primary purpose of this study was to examine the impact of goals, expectations, and satisfaction with weight on weight loss maintenance.

Consistent with previous research (Foster et al., 1997), most participants were dissatisfied with their weight and less than 5% were very satisfied with their weight losses, despite having lost at least 5% of their weight prior to entering the study. Most participants were able to identify that their weight losses had a somewhat positive impact on various physical and psychological factors, however most participants still wanted to lose weight and expected to do so. Participants continued to aspire to "dream weights" that required, on average, weight losses of 24%, and chose "disappointed weights" that would still require an additional 4% weight loss.

In reality, over the course of 4 months, 66% of participants gained weight, 2% maintained their weight, and 32% lost additional weight.

Five primary hypotheses were tested in this study: (1) higher levels of satisfaction with weight would significantly predict maintenance of weight lost at follow up time points; (2) higher goals for maintaining weight would significantly predict weight regain at follow up time points; (3) higher expectations for maintaining weight would significantly predict weight regain at follow up time points; (4) lower goals for maintaining weight would significantly predict satisfaction with weight at follow up time points; and (5) lower expectations for maintaining weight would significantly predict satisfaction with weight at follow up time points.

Contrary to hypotheses 1-3, satisfaction, goals, and expectations did not significantly predict weight change at any follow up time points. The strongest predictor of weight change over time was baseline weight, specifically, higher baseline weights predicted greater weight gain over time. While the relationship between goals and outcomes in the broader literature has been well documented (see Locke and Latham, 2002 for a review), this relationship has not been consistently found in the context of goals and expectations for weight loss (Ames et al., 2005; Finch et al., 2005; Foster et al, 2004; Jeffrey et al, 1998; Linde et al., 2004; Wadden, et al., 2003). While goals play a role in much of human behavior, in the context of weight loss and maintenance, perhaps they are either (a) part of a far more complex relationship that is moderated by other psychological variables or (b) simply of less importance in regard to weight loss and maintenance. In hindsight, it may have been

interesting to consider examining potential moderators in the relationship between goals and weight change, such as motivation to meet goals, commitment to goals, importance of goals, level of engagement in weight loss maintenance strategies, confidence in ability to achieve these goals, and barriers to accomplishing these goals. These variables were not assessed in this study, but future research could examine the moderating effect of such variables.

On the other hand, goals and expectations may simply be less important as anticipated in the context of weight loss and maintenance. Perhaps these constructs are trivial compared to other variables, such as motivation to maintain weight, self-efficacy for maintaining weight, or barriers to maintaining weight. In addition, this study was guided by the idea that levels of goals or expectations (e.g., high versus low, unrealistic versus realistic) would predict weight change. Perhaps it is not the level of goals or expectations that impact weight loss maintenance, but the act of setting a goal or not setting a goal. Future research could examine the impact of having goals and expectations versus not having goals and expectations on weight change.

It was surprising to find that satisfaction did not impact weight change, as it has been documented that there is a strong relationship between satisfaction and outcomes (Carver & Sheier, 1990; Hsee & Abelson, 1991; Locke & Latham, 2002). This relationship has also been seen specifically in the context of the weight loss literature (Finch et al., 2005; Foster et al., 2004; Wadden et al., 2003). It should be noted that satisfaction was negatively correlated with weight, indicating that greater

satisfaction was associated with less weight gain and lower satisfaction was associated with greater weight gain. The lack of a significant predictive relationship may have been due to the non normal distribution of the sample. As previously noted, the sample was somewhat positively skewed, with a large percentage of participants reporting great dissatisfaction with their weight. In addition, it is possible that there are other variables that moderate the relationship between satisfaction and weight change or that satisfaction is less important than other factors, such as motivation or self-efficacy. While satisfaction may have some positive impact, perhaps it is not reinforcing enough to facilitate weight loss maintenance.

There was no support for hypothesis 4, that goals at baseline would predict satisfaction with weight. The strongest predictors of satisfaction with weight at the 2 month time point included baseline weight, satisfaction with weight at baseline, fruit and vegetable intake, and fatty food intake. While it is not surprising that baseline weight and satisfaction at baseline were the strongest predictors of satisfaction at 2 months, it is interesting that dietary intake was also a significant predictor. Participants who had higher intake of fruits and vegetables and lower intake of fatty foods appeared to be more satisfied with their weight at the 2 month time point. Interestingly, the same model was significant at the 4 month time point, however, none of the variables were significant predictors of satisfaction at 4 months. It should be noted that goals at baseline were negatively correlated with satisfaction with weight at baseline, indicating that lower goals were associated with greater satisfaction and higher goals were associated with lower satisfaction at baseline.

Similarly, goals at baseline were also negatively correlated with satisfaction with weight at 2 and 4 months.

Similarly, there was no support for hypothesis 5, that expectations at baseline would predict satisfaction with weight over time. Again, the strongest predictors of satisfaction with weight at the 2 month time point were baseline weight, satisfaction at baseline, fruit and vegetable intake, and fatty food intake. This again indicates that better dietary intake predicted satisfaction with weight at 2 months. Again, the same model was significant at 4 months, however none of the variables were significant predictors of satisfaction at 4 months. Taken together, baseline weight, fruit and vegetable intake, and fatty food intake predicted satisfaction with weight at 2 months, but these variables lost their predictive power at 4 months. It should be noted that expectations at baseline were positively correlated with satisfaction at baseline, indicating that greater expectations were associated with greater satisfaction. Given this study's hypotheses, we would have expected a negative correlation between these two variables, however, this could be interpreted as satisfaction being associated with optimistic expectations about maintaining weight. Expectations at baseline were also positively correlated with satisfaction at 2 and 4 months.

It is interesting that no variables were predictive of satisfaction at the 4 month time point, not even baseline levels of satisfaction. Again, this may be due to the non normal distribution of satisfaction in this sample. However, these findings were not altogether surprising, given the lack of strong evidence for the impact of weight loss goals on satisfaction (Finch et al., 2005). Perhaps the types of goals and expectations

that people set are inconsequential compared to other factors that may predict satisfaction. These null findings raise the question: what *does* predict satisfaction with weight? Even if research were to identify variables that predicted satisfaction with weight, would this be relevant, given the results of this study did not show that satisfaction ultimately impacted weight change?

Overall, satisfaction with weight, goals at baseline, and expectations at baseline were not significant predictors of weight change, and the strongest predictor of weight change was baseline weight. In addition, goals and expectations at baseline were not significant predictors of satisfaction with weight at follow up time points.

Secondary Hypotheses

Five secondary hypotheses were tested in this study: (6) satisfaction with weight at baseline would significantly predict better dietary habits at follow up time points; (7) satisfaction with weight at baseline would predict better exercise habits at follow up time points; (8) satisfaction with weight at baseline would predict lower levels of depression at follow up time points; (9) satisfaction with weight at baseline would predict lower levels of trait anxiety at follow up time points; and (10) satisfaction with weight at baseline would predict lower levels of state anxiety at follow up time points.

There was no support for hypothesis 6 or 7, that satisfaction with weight at baseline would significantly predict better dietary habits or exercise habits over time. Baseline levels of fruit and vegetable intake, fatty food intake, and exercise habits were the strongest predictors of dietary intake and exercise habits at follow up time

points. It should be noted that fruit and vegetable intake at baseline was positively correlated with satisfaction at 4 months and fatty food intake at baseline was negatively correlated with satisfaction at 4 months, indicating that healthy eating habits are associated with satisfaction with weight.

There was no support for hypothesis 8, that satisfaction with weight at baseline would predict depression over time. Baseline levels of depression were the strongest predictors of depression at follow up time points. Lastly, there was no support for hypothesis 9 or 10, that satisfaction with weight at baseline would significantly predict trait or state anxiety over time. Baseline levels of these variables were the strongest predictors of trait and state anxiety at follow up time points. It should be noted that depression and trait anxiety at baseline were positively correlated with weight change at 4 months, indicating that there is an association between negative mood and weight gain. Given that satisfaction with weight did not predict better dietary habits, better exercise habits, depression or anxiety, perhaps satisfaction with weight does not facilitate engagement in weight maintenance strategies.

While predictive relationships were not found to be significant, descriptive data were consistent with the theories of goal setting, expectations, and satisfaction in the broader psychological literature that were previously reviewed. Participants were dissatisfied with their weight at baseline and had fairly low expectations for maintaining their weight. In addition, they had goals to continue to lose considerable amounts of weight, however, most participants fell short of these goals by the end of the study. Goal setting theory (Locke & Latham, 2002) posits that greater goals fuel

greater effort and performance, however performance decreases when goals exceed ability or become too difficult. This process may have occurred in this sample, wherein goals to continue to lose weight were high, but the difficulty associated with losing weight was too great, and thus, effort toward losing weight waned and most participants ultimately gained weight. In addition, when individuals do not meet their goals, they tend to experience dissatisfaction and may disengage from their goals (Bandura & Cervone, 1983; Cervone et al., 1991). Similarly, various theories describe a pattern in which unfavorable expectations lead individuals to disengage from their efforts toward their goals (Bandura, 1986; Carver & Scheier, 1982; 1990; Cervone, 1993; Klinger, 1975; 1987). Individuals in this study were dissatisfied with their weight, had low expectations for maintaining their weight, and most subsequently gained weight, thus it is likely that they disengaged from the behaviors necessary to maintain or lose weight. It is also possible that these individuals were “unrealistically” optimistic about their goals, potentially leading them to feel frustrated and put forth less effort toward their goals (Oettingen, 1996; Polivy & Herman, 2002). It should be noted that this study did not measure level of engagement and effort toward goals, however the pattern observed in the descriptive data appears to be consistent with patterns described in the broader psychological literature.

Descriptive data from this study were consistent with similar studies in the area of weight loss (Foster et al., 1997; 2001; 2004; Wadden et al., 2003). Participants defined their “dream weights,” “happy weights,” and “acceptable

weights,” as weights that required large weight losses, and even their “disappointed weights” required, on average, a loss of nearly another 4% of their body weight. Consistent with previous research (Foster et al., 1997), participants were dissatisfied with their weight, despite having lost at least 5% of their body weight, and lower satisfaction was associated with greater weight gain over time. Overall, while none of the hypothesized predictive relationships were supported, descriptive data appear to support theories of goals, expectations, and satisfaction.

Limitations

This study had many limitations that should be considered when interpreting findings. First, the study sample was small and certain variables of interest (e.g., satisfaction with weight and expectations) were not normally distributed, thus results should be interpreted with caution. Results may be difficult to generalize, as the study sample was highly homogenous, with the majority of participants being female, Caucasian, and highly educated. In addition, participants were not remunerated for their time in the study, and thus may have been more motivated than the average individual who is attempting to maintain weight loss. This study also lacked long-term follow up, as participants were only followed for the course of 4 months.

Participants were recruited from a number of different sources, including behavioral weight loss treatments of varying lengths, modes of delivery, and strategies. Some participants did not engage in formal weight loss treatment. Therefore the sample was not as “clean” as intended. While none of these treatment

variables were significantly correlated with the criterion variables, the variability in the sample decreased internal validity.

A major challenge was finding individuals who had lost weight and were seeking to maintain their weight losses. Although the study was advertised as examining weight loss maintenance, and participants reported a desire to maintain their weight losses, many wanted to continue to lose weight. In fact, results indicated that 94% of participants still desired to lose weight. Given that most participants wanted to continue to lose weight, results cannot be interpreted as representative of individuals who were truly in the weight loss maintenance phase. Interestingly, it may be difficult to find individuals who have lost weight and do not want to continue to lose weight, thus creating a problem in differentiating the weight loss phase from the weight loss maintenance phase. This will likely be an ongoing problem for research that seeks to examine psychological factors and processes related to the weight loss maintenance phase.

Lastly, satisfaction with weight was a 1-item measure in the study. This variable was not found to be a significant predictor of weight change, dietary habits, exercise habits, depression, or anxiety, nor was it significantly predicted by goals or expectations. It is possible that satisfaction with weight is far more complex construct and should be measured in a more comprehensive manner. Similarly, expectations for weight loss maintenance was also a 1-item measure, and perhaps this did not capture the complexity of participants' expectations following the weight loss phase.

Implications and Future Directions

This study did not provide support that goals, expectations, or satisfaction with weight were predictive of weight change, nor were goals or expectations predictive of satisfaction with weight. It can be argued that these constructs are not relevant to weight loss maintenance, given the lack of significant findings. It can also be argued that other variables may moderate the impact of goals, expectations, and satisfaction on weight change, such as motivation toward goals, commitment to goals, engagement in weight maintenance strategies, self-efficacy, and barriers to accomplishing goals. Examination of potential moderators may shed light on any potential relationships between goals, expectations, satisfaction, and weight change.

As previously mentioned, it may be helpful to further operationally define satisfaction with weight. Perhaps satisfaction with weight is a far more complex construct than initially thought, consisting of various dimensions of satisfaction. Beyond satisfaction with a specific weight, it may be important to explore satisfaction with the various effects of weight loss. For example, an individual may be dissatisfied with their current weight, but may be very satisfied that he or she has lost 5% of their body weight and is able to engage in activities that were previously difficult to engage in. Gaining a more cohesive understanding of the various factors that impact satisfaction may provide insight as to whether satisfaction with weight is relevant to weight loss maintenance. Qualitative exploration of participants' satisfaction with weight may help facilitate more precise measurement of this variable.

Despite the lack of significant findings in this study, improving weight loss maintenance continues to be a priority, given the problems associated with the overweight and obesity epidemic. There should be a continued emphasis on understanding the factors that facilitate successful weight loss maintenance. While the strategies involved in successful weight loss maintenance have been identified (e.g., high levels of physical activity, low-calorie, low-fat diet, regular weighing, etc.), the psychological processes that drive these strategies have not been extensively examined. Further examination of the psychological variables related to engaging in these strategies (e.g., motivation, commitment, self-efficacy, and barriers) may provide a more comprehensive understanding of what leads individuals to engage in these critical weight loss maintenance behaviors.

Taken together, the results of this study indicate that goals, expectations and satisfaction are not significant predictors of weight change, nor are goals and expectations significant predictors of satisfaction with weight. In addition, satisfaction with weight is not a significant predictor of dietary habits, exercise habits, depression, or anxiety. Given the significant consequences associated with obesity, along with the problem of weight regain following weight loss treatment, research must continue to examine the psychological processes associated with successful weight loss maintenance.

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APPENDICES

Study Forms and Measures

APPENDIX A

Informed Consent Form Writing and Weight Loss Maintenance

Introduction: The Department of Psychology at the University of Kansas supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish to participate in the present study. You may refuse to sign this form and not participate in this study. You should be aware that even if you agree to participate, you are free to withdraw at any time. If you do withdraw from this study, it will not affect your relationship with this program, the services it may provide to you, or with the University of Kansas.

Study Purpose: This study will explore the effects of written disclosure on factors that may impact weight loss maintenance and emotional well-being.

Explanation of Procedures: Participating in this study will require a total time commitment of approximately 4 hours. Your participation will involve the following:

- You asked to complete a variety of questionnaires and will be weighed.
- You will spend 20 minutes writing about a topic that is selected by us four times over the course of four weeks.
- You will be asked to return for two brief follow-up visits 1 and 3 months following the final writing session. At these visits you will be weighed and asked to complete a variety of questionnaires.

Potential Risks/Discomforts: It is possible that filling out questionnaires and writing sessions may be time consuming and potentially bothersome, but there are no anticipated risks in participating in this study.

Potential Benefits: You may find the writing sessions to be a helpful and valuable experience. In addition, your participation in this study may advance our understanding and development of weight loss programs.

Compensation for Participation: There is no compensation for participation in this study.

Participant Confidentiality: Your name will not be associated in any way with the information collected about you or with the research findings from this study. The researcher(s) will use a study number instead of your name. If the results of this study are published or presented in public, information that identifies you will be removed. The researchers will not share information about you unless required by law or unless you give written permission. Permission granted on this date to use your information remains in effect indefinitely. By signing this form you give permission for the use your information for purposes of this study at any time in the future.

Refusal to sign consent and authorization: You are not required to sign this Consent and Authorization form and you may refuse to do so without affecting your right to any services you are receiving or may receive from the University of Kansas or to participate in any

programs or events of the University of Kansas. However, if you refuse to sign, you cannot participate in this study.

Canceling this Consent and Authorization: You may withdraw your consent to participate in this study at any time. You also have the right to cancel your permission to use and disclose information collected about you, in writing, at any time, by sending your written request to: Olivia L. Chang, M.A., 319 Fraser Hall, University of Kansas, Lawrence, KS 66045. If you cancel permission to use your information, the researchers will stop collecting additional information about you. However, the research team may use information that was gathered before they received your cancellation, as described above.

Questions about participation: Questions about procedures should be directed to Olivia L. Chang, M.A. Her contact information is listed at the end of this consent form.

Participant certification: I have read this Consent and Authorization form. I have had the opportunity to ask, and I have received answers to any questions I had regarding the study. I understand that if I have any additional questions about my rights as a research participant, I may call (785) 864-7429 or write to the Human Subjects Committee Lawrence Campus (HSCL), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7563, or email dhann@ku.edu.

I agree to take part in this study as a research participant. By my signature I affirm that I am at least 18 years old and that I have received a copy of this Consent and Authorization form.

Participant's Name (PRINT)

Date

Participant's Signature

Researcher Contact Information

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Principal Investigator
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APPENDIX B

Statement of Informed Consent University of Kansas Medical Center

Writing and Weight Loss Maintenance

INTRODUCTION

We invite you to participate in a study exploring the process of writing and weight loss maintenance. This study is being conducted by principal investigator Bruce S. Liese, Ph.D., a psychologist in the Department of Family Medicine at the University of Kansas Medical Center. We hope to learn more about factors related to weight loss maintenance. We expect to recruit approximately 130 individuals in the Kansas City metro area.

You do not have to participate in this research study. It is important that before you make a decision to participate, you read the rest of this form. You should ask as many questions as needed to understand what will happen to you if you participate in this study.

BACKGROUND

Obesity rates continue to be on the rise in the United States. Obesity is projected to overtake smoking as the number one cause of preventable death in the United States. Currently, two out of three adults in the United States are now considered overweight or obese, compared to one out of four in the 1960's. The prevalence of obesity among U.S. adults increased 5.6% from the year 2000 to 2001 (19.8% to 20.9%). This increase has occurred regardless of sex, age, race, and educational status. Being overweight or obese significantly increases risk for premature mortality and serious health problems (e.g., diabetes, cardiovascular disease, hypertension, cerebrovascular disease, cancer, and osteoarthritis). In addition to the health consequences stemming from the obesity epidemic, the economic consequences are also cause for alarm. The direct and indirect economic cost of obesity was approximately \$100 billion in 1995.

Developing strategies to improve weight maintenance following weight loss treatments for obesity continues to be a challenge for obesity researchers. Without continued treatment, it is common for individuals to regain approximately one third of their weight lost within a year following treatment and they will continue to exhibit weight gain over time. Therefore, it is important that we consider examining additional approaches to helping people maintain their weight loss over time.

PURPOSE

The purpose of this study is to explore the effects of writing on factors that may impact weight loss maintenance and emotional well-being. This research is intended to help us understand how we can improve weight loss and weight loss maintenance programs and to develop approaches to better prevent and treat the problem of obesity.

PROCEDURES

If you are eligible and decide to participate in this study, your participation will last approximately four hours over the course of three months. Your participation will involve being weighed, filling out questionnaires and writing about topics selected by us 4 times over the course of 4 consecutive weeks. Participants will be randomly assigned by the research investigators to one of two groups. Each group will write about different topics. Randomization is like “flipping a coin” to decide what group participants will be assigned to. You will be asked to return for two brief follow-up visits 1 and 3 months following the final writing session. At these visits you will be weighed and asked to complete a variety of questionnaires. Each of these activities will be completed as followed during six brief study visits over the course of three months.

Visit 1: You will be weighed, fill out questionnaires and spend 20 minutes writing.
(Time = 75-90 min)

Visit 2: You will be weighed and spend 20 minutes writing.
(Time = 30 min)

Visit 3: You will be weighed and spend 20 minutes writing.
(Time = 30 min)

Visit 4: You will be weighed, spend 20 minutes writing and fill out questionnaires.
(Time = 45 min)

Visit 5: You will be weighed and fill out questionnaires.
(Time = 20-30 min)

Visit 6: You will be weighed and fill out questionnaires.
(Time = 20-30 min)

RISKS

It is possible that filling out questionnaires and writing sessions may be time consuming and potentially bothersome, but there are no other anticipated risks for participating in this study.

NEW FINDINGS STATEMENT

You will be informed if any significant new findings develop during the course of the study that may affect your willingness to participate in this study.

BENEFITS

There are several potential benefits for you and society at large. You may find the writing sessions to be a helpful and valuable experience. Your participation in this study may also advance our understanding and development of weight loss programs. Furthermore, you may derive personal satisfaction and growth from the knowledge that you participated in a study that may have public health implications and may contribute to existing scientific knowledge.

ALTERNATIVES

Participation in this study is completely voluntary. Deciding not to participate will have no effect on the care or services you receive at University of Kansas Medical Center.

COSTS

There are no costs to you for participating in this study.

PAYMENT TO SUBJECTS

There is no compensation for participation in this study.

INSTITUTIONAL DISCLAIMER STATEMENT

Although the University of Kansas Medical Center does not provide free medical treatment or other forms of compensation to persons injured as a result of participating in research, such compensation may be provided under the terms of the Kansas Tort Claims Act. If you believe you have been injured as a result of participating in research, you should contact the Office of Legal Counsel, Mail Stop #2013, University of Kansas Medical Center, 3901 Rainbow Blvd., Kansas City, KS 66160.

CONFIDENTIALITY AND PRIVACY AUTHORIZATION

Efforts will be made to keep your personal information confidential. Researchers cannot guarantee absolute confidentiality. If the results of this study are published or presented in public, information that identifies you will be removed.

The privacy of your health information is protected by a federal law known as the Health Insurance Portability and Accountability Act (HIPAA). By signing this consent form, you are giving permission (“authorization”) for KUMC to use and share your health information for the purposes of this research study. If you decide not to sign the form, you cannot be in the study.

To do this research, we need to collect health information that identifies you. We will collect information from activities described in the Procedures section of this form.

Your study-related health information will be used at KU Medical Center by Dr. Bruce Liese, members of his research team, the KUMC Research Institute, the KUMC Human Subjects

Committee and other committees and offices that review and monitor research studies. Study records might be reviewed by government officials who oversee research, if a regulatory review takes place.

All study information that is sent outside KU Medical Center will have your name and other identifying characteristics removed, so that your identity will not be known. Because identifiers will be removed, your health information will not be re-disclosed by outside persons or groups and will not lose its federal privacy protection.

Your permission to use and disclose your health information remains in effect until the study is complete and the results are analyzed. After that time, information that personally identifies you will be removed from the study records.

QUESTIONS

You have read the information in this form. Dr. Liese or his associates have answered your question(s) to your satisfaction. You know if you have any more questions after signing this you may contact Dr. Liese or one of his associates at (913) 588-1912. If you have any questions about your rights as a research subject, you may call (913) 588-1240 or write the Human Subjects Committee, Mail Stop #1032, University of Kansas Medical Center, 3901 Rainbow Blvd., Kansas City, KS 66160.

SUBJECT RIGHTS AND WITHDRAWAL FROM THE STUDY

You understand that your participation in this study is voluntary and that the choice not to participate or to quit at any time can be made without penalty or loss of benefits. You understand that not participating or quitting will have no effect upon the medical care or treatment you receive now or in the future at the University of Kansas Medical Center. The entire study may be discontinued for any reason without your consent by the investigator conducting the study.

You have a right to change your mind about allowing the research team to have access to your health information. If you want to cancel permission to use your health information, you should send a written request to Dr. Bruce S. Liese. His mailing address is Bruce S. Liese, Ph.D., University of Kansas Medical Center, Department of Family Medicine, MS 4010, 3901 Rainbow Boulevard, Kansas City, KS 66160. If you cancel permission to use your health information, you will be withdrawn from the study. The research team will stop collecting any additional information about you. The research team may use and share information that was gathered before they received your cancellation.

CONSENT

Dr. Liese or his associates have given you information about this research study. They have explained what will be done and how long it will take. They explained any inconvenience, discomfort or risks that may be experienced during this study.

I freely and voluntarily consent to participate in this research study. I have read and understand the information in this form and have had an opportunity to ask questions and have them answered. **I will be given a signed copy of the consent form to keep for my records.**

Type/Print Participant's Name

Signature of Participant

Time

Date

Type/Print Name of Person Obtaining Consent

Signature of Person Obtaining Consent

Date

APPENDIX C

Please do not write your name on these sheets. All information will be used for classification purposes only based on your participant ID number. Please complete this form to the best of your ability.

General Health History

1. Have you ever used tobacco products? Yes No

2. Do you presently smoke or use tobacco? Yes No

If Yes: 2a. What type? _____

2b. Amount per week? _____

3. If you don't currently smoke or use tobacco, have you quit in the last 6 months?
 Yes No

3a. If not in the last 6 months, when did you quit? _____

4. Do you drink alcohol? Yes No

4a. If Yes: What type? _____

4b. Amount per week? _____

5. Have you ever been diagnosed with any of the following conditions? Please mark an "X" next to any condition that applies to you.

"X"	Condition	"X"	Condition
	a. AIDS/HIV		v. Impaired Vision (includes glasses/contacts)
	b. Anemia		w. Impaired Hearing
	c. Anorexia		x. Kidney Disease or Stones
	d. Anxiety		y. Lung Problems (e.g., asthma, bronchitis)
	e. Arthritis		z. Lupus
	f. Bleeding/Clotting Problem		aa. Migraine Headaches
	g. Blood Circulatory Problems or Clots		bb. Multiple Dystrophy or Sclerosis
	h. Bulimia		cc. Prostatitis/Prostate Enlargement
	i. Cancer (past or present)		dd. Sickle Cell Anemia
	j. Depression		ee. Stomach/Intestinal Problems
	k. Diabetes (Type I)		ff. Stroke
	l. Diabetes (Type II)		gg. Thyroid Disorders
	m. Drug or Alcohol Abuse		hh. Other (specify below):

QUESTIONS #8 & #9 APPLY TO FEMALES ONLY; MALES PROCEED TO QUESTION #10

8. FEMALES ONLY: Are you taking or have you taken in the last 6 months:

Yes No

 8a. Birth Control Pills?

 8b. Implanted or injected contraceptives?

 8c. Hormone Replacement?

9. FEMALES ONLY: Please mark an "X" next to any of the following that apply to you:

Yes No

 9a. Have you been pregnant in the last year?

 9b. Are you currently breast-feeding?

 9c. Are you trying to become pregnant?

 9d. Have you had a hysterectomy?

 9e. Have you had fallopian tubal ligation?

 9f. Are you post-menopausal?

Weight History

10. What is your highest adult weight? _____

11. What is your lowest adult weight? _____

12. What is your ideal weight goal? _____

13. Do you have difficulty controlling your weight? _____ Yes _____ No

13a. If Yes, what factors make it difficult for you to control your weight?

14. What weight loss program(s) have you been involved in during the past year?

15. Are you currently actively participating in a weight loss program?

_____ Yes _____ No

15a. If Yes, What program?

15b. When did you begin this program?

16. How much weight have you lost in the program(s) mentioned above? _____

16a. Have you gained any of this weight back? _____ Yes _____ No

16b. If Yes, how much weight have you gained back? _____

17. How much weight did you WANT to lose BEFORE YOU STARTED your weight loss program(s)? _____

18. Please describe in detail your history of weight loss, weight gain, and weight loss maintenance over the past 5 years.

Journal writing

19. Do you do any journal writing in your personal life? _____ Yes _____ No

19a. If Yes, How often do you journal? _____ Daily _____ Weekly
_____ Monthly _____ <6 times per year

Demographic Information

20. Sex: _____ Female _____ Male

21. What do you consider your race to be?

_____ Black	_____ Native American
_____ White/Caucasian	_____ Pacific Islander/Alaskan Native
_____ Asian	_____ Don't know
_____ Hispanic	_____ Other _____

22. Date of Birth: _____
Month Day Year

23. What is your current age? _____

24. What is your marital status?

_____ Single/Never Married	_____ Married or living with someone as if married
_____ Separated	_____ Divorced
_____ Widowed	

25. Do you have any children? _____ Yes _____ No

If Yes: 25a. How many? _____

25b. How many live with you? _____

26. What is the highest grade in school that you completed?

_____ Never attended school	_____ Less than 8 th grade	_____ Some high school
_____ Completed high school	_____ Some college	_____ Completed college
_____ Completed master's degree	_____ Completed doctoral degree	

27. What is your best estimate regarding your average yearly income?

- Less than \$10,000 per year
- \$10,000 – \$14,999 per year
- \$15,000 – \$19,999 per year
- \$20,000 – \$24,999 per year

- \$25,000 – \$34,999 per year
- \$35,000 – \$49,999 per year
- \$50,000 – \$74,999 per year
- \$75,000 or more per year