

PREDICTORS OF WEIGHT LOSS USING SELF
CHANGE METHODS AMONG
COLLEGE STUDENTS

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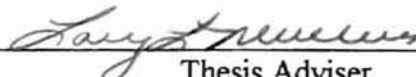
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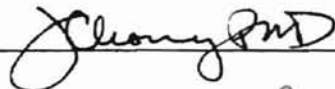
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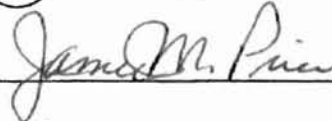
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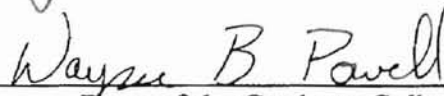
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CHAPTER I

INTRODUCTION

Obesity is a prevalent and increasing problem in the United States today. As stated by VanItallie (as cited in Brownell & Foreyt, 1985), rates of serious weight problems have doubled since the 1900's. In the United States, it is estimated that 24.2% of men (15.4 million) and 27.1% of women (18.6 million) meet the criterion for overweight, described as maintaining 120% or more of desirable body weight (Brownell, 1995). Preliminary analysis of data collected in the 1990s suggest that the prevalence of obesity in the United States may have increased to approximately 34% in both men and women. Ethnic and gender variations have also been found among obese individuals, with African American women having the highest levels of obesity in the country, followed by Mexican American and European American women, respectively. Only modest variation was found between ethnicities among American men. Incidence rates in the United States indicate that, when measured over a ten year period, the risk of becoming overweight is highest for persons between the ages of 35 and 44 years and lowest for persons between 65 and 74 years (Williamson, 1995).

Many treatment techniques and programs have been established to combat the growing weight problem. Because of the increased emphasis on the biological aspects of

obesity and the growing view that it is a biological disorder of energy regulation, many new drug therapies have been introduced. Studies have shown that obese subjects experience significant weight loss after receiving drug treatment as compared to subjects taking placebos (Grilo, 1996). Unfortunately, longitudinal research shows that termination of drug treatment has consistently proven to result in weight regain (Galloway, Farquhar, & Munroe, 1984). However, drugs administered in combination with dietary restrictions and behavior therapy have resulted in more prolonged weight maintenance (Grilo, 1996).

Psychological treatments incorporate learning principles to guide and correct the problematic eating behaviors of the obese. These types of behavioral therapies focus on identifying the antecedents and consequences of behaviors that lead to weight gain, and are generally paired with dietary and exercise interventions (Grilo, 1996). Increases in weight loss appear to be directly related to the length of treatment (Wilson, 1995). However, behavioral treatments are also associated with substantial weight gains after treatment termination (Brownell, 1992).

Each year, thousands of individuals frustrated with their weight turn to commercial and fad diets, exercise, therapy, over-the-counter medications, and prescription drugs as methods for weight reduction. Unfortunately, it has been projected that 95% of the people who lose weight by these methods will regain it at some point in time (Brownell, 1992). Thus, attempts to lose weight through formal diet plans and other methods do not typically result in the desired outcome of sustained weight loss. The average weight lost during a structured treatment regimen is approximately 0.5 kg per week (Brownell & Wadden, 1992). Approximately 60% to 70% of the lost weight is likely to be maintained

for about one year after treatment is completed. However, follow-up studies indicate that within three to five years after treatment, weight will return to pretreatment levels. A study by Wadden, Sternberg, Letizia, Stunkard, and Foster (as cited in Brownell, 1992) randomly assigned patients to either very-low calorie-diets, behavior therapy, or a combination of the two treatments to determine which treatment regimen would be most effective. A five-year evaluation showed that the mean weight of the subjects in all three conditions had returned to baseline. These findings are not uncommon and are supported by other research that suggests that persons who succeed in losing weight at all tend to gain the weight back and more over time.

The absence of positive results from clinical programs may be an influential factor in the growing number of individuals who are, according to Cowen, attempting to implement changes on their own and avoiding the use of any formal treatment (as cited in Prochaska, DiClemente, Velicer, Gimpil, & Norcross, 1985). Schacter (1982) found that self change rates among individuals attempting to lose weight were between two and three times higher than the success rates for conventional programs. Rzewnicki and Forgas (1987) obtained similar findings when they attempted to replicate Schacter's study. Despite these promising results, there is relatively little information available on how people change their behavior without the utilization of formal treatment programs (Brownell, 1992).

In order to address the lack of knowledge in this area, this study will focus on factors that predict weight loss in individuals using self change methods in an attempt to lose weight. Identifying variables that enhance people's abilities to lose weight through self change could result in more individuals reaching and maintaining their desired weight

on their own. The self change method is not only a less costly alternative to formalized programs, but identifying factors that enhance the ability to change behavior could be useful information for behavior change across many other addictive behaviors.

Developing techniques that enhance those factors that improve weight loss ability could reduce the obese population in the United States and possibly help others before they become part of the obese population themselves.

The stages of change theory developed by Prochaska and DiClemente (1982) will guide the current research. Using this approach, the process of behavior change can be broken down into a series of stages that can be followed and monitored. According to the stages of change theory, behavior change is achieved through a series of cognitive and motivational changes labeled "precontemplation", "contemplation", "action", and "maintenance" that are used to describe when change occurs. The stages of change model provides a framework for examining the course of behavior change and can be applied to those individuals attempting to lose weight. By utilizing this theory, the progression of an individual toward successful weight loss can be monitored and may be used to aid in the identification of factors that predict successful weight loss. Change is monitored by assessing progression through the stages from precontemplation, to contemplation, action, and finally maintenance.

In sum, the purpose of this study is to identify those characteristics that can accurately predict successful self change in individuals attempting to lose weight. Identifying those features belonging to individuals who have successfully lost weight on their own may enable others to achieve their desired weight. By enhancing variables that are predictive of self change, obese individuals may be able to improve their chances of

reaching their weight goals without the use of formalized treatments. The current study will focus on stages of change, levels of social support, self-efficacy, and decisional balance as characteristics that may be predictive of successful weight loss. Stages of change, higher levels of social support, self-efficacy, and a decision-making process where the cons of obesity outweigh the pros are hypothesized to be distinctive qualities of individuals who succeed in achieving their weight loss goals through self change techniques.

The following review of the literature will provide the background information for this study. The causes and effects of obesity will be discussed, followed by a description of the current treatments being used to combat this problem. Finally a review of the stages of change model, self change research, and the three predictor variables will be presented.

CHAPTER II

REVIEW OF THE LITERATURE

Incidence and Prevalence

Obesity is one of the United States' leading health problems because of its increasing prevalence, resistance to change, and related health complications (Brownell & Wadden, 1992). It is estimated that there are 34 million overweight adults (15.4 million men and 18.6 million women) in the United States (Williamson, 1995). This overweight classification includes all adults who are between 20% and 40% over their ideal body weight (Brownell, 1995). Individuals who are between 40% and 100% over their ideal body weight are categorized as severely overweight. The severely overweight category includes 8.0% of men (5.1 million) and 10.6% of women (7.4 million) in the United States. Morbid obesity includes 0.6% of men (327,000) and 2.5% of women (1.7 million) in the United States and encompasses all individuals who have exceeded their ideal body weight by over 100%. This particular data may greatly underestimate the true levels of morbid obesity due to the low levels of health survey participation in this population (Williamson, 1995).

Obesity rates in children and adolescents are also alarmingly high. Childhood obesity is one of the most common diseases in the younger population of the United States today (Dietz, 1995). According to tricep skinfold data collected from 1962 to 1980, over

50% of children and over 40% of adolescents are overweight. Based on this information, approximately one in five children in the United States is obese (Dietz, 1995).

Incidence rates for obesity indicate that there are marked differences in weight change over time with regard to age and gender (Williamson, 1995). Individuals aged 25 to 34 gained the most weight over a ten-year period, while individuals aged 65 to 74 showed the largest amount of weight loss. In addition, women typically experience larger weight gains and losses than men, irrespective of age.

Causes of Obesity

The complexity of obesity does not lend itself to a simple explanation for its causes. Theories about the etiology take into consideration the interactions of genetics, physiology, psychology, environment, and cultural factors (Brownell & Foreyt, 1985). . . . The set-point theory suggests that the weight of all humans is regulated around a biologically determined standard and that this standard may be different for different people (Brownell & Foreyt, 1985). The implication of this theory is that individuals with set-points above society's standards will be faced with physiological and psychological resistance if they attempt to lose weight. The fat-cell theory proposes that levels of body fat are determined by the size and number of fat cells a person has (Brownell & Foreyt, 1985). Obesity is reached by the enlargement of these cells. Weight loss can only occur through a reduction in the size of the fat cells, but the number of fat cells that exist will always remain the same. The set-point and fat-cell theories emphasize the considerable impact physiology has on weight. In support of these theories, Stunkard, Harris, Pederson, and McClearn (1990) used identical twins reared apart to determine the impact of genetics

on body weight. They concluded that 70% of the variance of the body mass index can be accounted for by heritable factors.

Social learning theory maintains that certain environmental cues tend to increase the probability of overeating (Brownell & Foreyt, 1985). By limiting or extinguishing these cues, it is theorized that inappropriate eating behavior will be curbed. Eating style is another focus of this theory, suggesting that obese people may eat more rapidly than normal weight people. Social learning theory uses behavioral strategies to change exposure to environmental cues and eating habits. Several other theories exist that propose their own ideas as to the causes of obesity, but no single theory or cause has been identified as the true origin of the problem.

Complications

Obesity has several comorbid conditions that frequently occur and cause aversive health and social complications. Mortality rates increase rapidly depending on the percentage of overweight of an individual (VanItallie & Lew, 1992). Increased hypertension and coronary artery disease rates are many times higher in the obese than in people of normal weight. The extra pressure placed on the heart and lungs increases the risk of respiratory abnormalities, especially hypoventilation, which can result in pulmonary embolism and even death (Craddock, 1978). Other health risks include increased rates of diabetes, gall stones, cholesterol, high blood pressure, cancer, pregnancy complications and liver damage leading to cirrhosis. Obesity also causes surgical complications because of the need for increased anesthesia, time in surgery, and slowed recovery leading to postoperative infections. Surgical conditions that may also occur include hernias,

carcinoma of the colon, diverticular disease of the colon, arterial disease, hemorrhoids, varicose veins, thrombophlebitis, and carcinoma of the uterus. Other physical discomforts that may result from obesity are heat intolerance, skin problems and painful weight-bearing joints (VanItallie & Lew, 1992).

Social costs are also an important consideration. Children in kindergarten have learned by this age to associate obesity with various undesirable traits (Dietz, 1995). Obese children are subject to more teasing and ridicule from peers, and adolescents with obesity have been shown to date less and be less involved in school activities. As these individuals grow older, they are faced with discrimination in college, job opportunities, and experience a higher level of poverty than their nonobese peers (Dietz, 1995).

Current Treatment Strategies

The basis for the treating obesity is very simplistic: energy output must exceed energy intake. However, there are many factors that need to be considered when choosing a method for losing weight (Stunkard, 1992). The degree of obesity must first be assessed. The three categories of obesity are differentiated by percentage overweight; these include 20% to 40% for "mild" obesity, 41% to 100% for "moderate obesity" and over 100% indicates "severe" obesity (Stunkard, 1992). Mild obesity is typically treated with conservative methods including diet, physical activity, and behavior modification. A combination of behavior therapy and very low calorie diets (VLCDs) is typically used to treat the moderately obese. The severely obese more often use surgery and pharmacotherapy to treat their problem. Although there are variations to each of these treatments, every method has certain attributes that have been shown to be effective.

Physical activity is one of the most highly recommended forms of treatment for weight difficulties (Brownell, 1995). It is the single strongest factor influencing the maintenance of long-term weight loss because it directly increases lean body mass, metabolic rate, and energy expenditure. Exercise programs can be individualized to provide sufficient frequency, intensity, and duration of physical activity for each overweight patient. In addition to the physical benefits, other positive results include decreased mortality rates, reduced stress, and improved self-assurance (Brownell, 1995). Studies focusing on adherence have identified cognitive issues, behavioral changes, and social factors that enhance exercise adherence in overweight individuals.

Popular and commercial diets are other treatment methods used to combat the problem of obesity (Dwyer, 1995). These diets generally encourage low-fat, high-fiber, high-carbohydrate meals that reduce energy intake. Success or failure of these diets most notably depends on the individual's degree of overweight, duration of overweight, and preexisting illnesses.

A more severe method of dieting used to treat obesity is the very low calorie diet or VLCD. There is no one universal definition of a VLCD. The only defining characteristic is that it is a diet providing less than 800 kilocalories per day (Wadden & Bartlett, 1992). This treatment is usually restricted to patients who are a minimum of 30% overweight, between the ages of 18 and 65, and have no history of Type I diabetes or any cardiac complications. The majority of VLCDs are commercially prepared, are in liquid form consisting mostly of hydrolyzed proteins, and are administered by a multidisciplinary team including a physician, psychologist, and dietitian (Wadden, 1995). The typical duration of a VLCD is 12 to 16 weeks and has favorable short term results. However, on

average patients treated using VLCDs regain 35% to 50% of their lost weight within one year following treatment (Wadden, 1995).

Behavioral techniques used to treat weight problems generally focus on modification of eating habits and changing level of physical activity (Wilson, 1995). Self-monitoring is the core feature of the behavioral approach to weight control and is used to keep detailed records of daily food intake and the environments in which eating occurs. Behavioral therapists can use this information to implement intervention strategies and improve the patient's progress. Self-monitoring is also useful in identifying individual and environmental influences that effect eating practices. Patients can use this information to break unhealthy eating habits as well as increase physical activity (Wilson, 1995). Behavioral treatments have been shown to consistently produce short-term weight loss in all categories of obese patients. However, five-year follow-up data indicates that the majority of patients eventually return to their original pretreatment weights (Wilson, 1995).

Pharmacological treatments of obesity are typically prescribed after a patient fails to lose weight or fails to maintain weight after losing it. These drugs work to reduce net energy intake, to increase energy expenditure, or to alter the storage of calories (Heshka & Heymsfield, 1995). Research focusing on drug therapies have shown that these agents are highly effective in producing weight loss for short-term and long-term use when compared to patients receiving placebos (Bray, 1988). However, the pharmacological methods used to treat obesity have many negative attributes. Patients experience variable side effects including fatigue, nausea, and drowsiness, and some drugs have the ability to

induce drug addiction. In addition, all agents require close monitoring of nutritional intake and medical status (Guy-Grand, 1992).

Surgical interventions are used as a last resort method to treat obesity (Kral, 1995). Most indications for surgery are serious conditions including hypertension, diabetes, and hypoventilation that are treatable through weight loss. There are two fundamentally different approaches currently used to surgically treat obesity: gastric restriction and gastrointestinal bypass (Kral, 1992). Gastric restriction consists of reducing the capacity of the stomach by inserting a small stapled pouch with a small opening into the stomach. This results in satiety by prolonging the time it takes for food to empty into the stomach. The flaws of this approach are that high caloric, easily dissolvable foods pass easily through the pouch and are easily digested and that repeated stretching of the pouch leads to increased pouch capacity. The alternative method, gastrointestinal bypass, involves an operation that excludes either 90% of the small intestine or 90% of the stomach from the digestive process. Although gastric bypass has been found to be more effective than gastric restriction, approximately 25% of patients fail to lose over 40% of their excess weight or they regain their weight within three to five years of surgery (Kral, 1992).

Although a majority of the treatments are capable of producing significant short-term weight loss, the amount of weight lost is far from optimal and is difficult to maintain (Brownell & Wadden, 1992). Long-term weight maintenance and relapse prevention are the greatest challenges faced by patients. Hovel et al. (1988) studied patients completing a health maintenance organization weight loss program. The average person lost 84% of their excess weight. However, at a 30-month follow-up, 59% to 82% of the lost weight

had been regained. These results greatly contrast with information on self-change which suggests that weight loss rates are much higher for individuals who avoid formalized treatments and use self-help methods in their weight control efforts (Schacter, 1982). Because of the disappointing treatment results, researchers have suggested that areas of future study should include improving the ability to predict which individuals will have the best results different types of weight loss techniques, including self-help efforts (Dwyer, 1995).

Stages of Change

Changes in behavior in the area of obesity have been seen as either successful or a complete failure, depending on weight maintenance or relapse. Prochaska, DiClemente, and Norcross (1992) have taken steps to show that changes in behavior can be broken down into a series of stages. The stages of change assess the temporal, motivational, and stability aspects of change. The four stages of change have been labeled "precontemplation", "contemplation", "action", and "maintenance". The precontemplation stage involves people who do not yet intend to change their behavior. These people are denying their problem, are unaware of it, are discouraged, or they are simply unwilling to change. Precontemplators do not perceive the negative aspects of their problem behavior to outweigh the positive aspects, and feel their behavior is well controlled. These individuals would be the least responsive to interventions focusing on change. The contemplation stage includes those who are aware of their problem and are actively considering change. Although contemplators are not yet prepared to take action, they are evaluating their options. These considerations include the consequences of change and the

personal aspects of the problem. The action stage is where individuals actively modify their behavior in order to remedy the problem. These individuals must possess the skills that enable them to change their habitual patterns of behavior as well as to prevent the return of those patterns. The maintenance stage involves preventing relapse and consolidating the changes made during the action stage. The stages of change model proposes that stages occur in a cyclic as opposed to a linear fashion and are able to determine when changes occur. Because modifying behavior is part of a learning process, and one trial learning is the exception rather than the norm, successful change may require several failed attempts before behavior can be permanently modified (Prochaska & DiClemente, 1992).

The stages of change model has been applied to a range of problem behaviors to show how individuals change high-risk behaviors and replace them with healthier behaviors. Identifying an individual's stage of change and the processes they use within each stage has been found to be useful when conceptualizing individual intentions and limits for behavior modification (Prochaska & DiClemente, 1992). Constructs used while moving through the stages can be integrated into the techniques used for promoting change during professional treatment of various problem behaviors. The stages of change have also been found to aid in explaining self-initiated behavior change such as modification of overeating as well as cigarette smoking, alcohol abuse, anxiety, and depression.

Self-Change

A considerable amount of research has been conducted on the effects of the existing weight loss treatments, but little is known about the behavior of people who change their eating habits and lose weight on their own. In 1982, Schacter attempted to focus on the issue of self-change in weight loss and smoking. He concluded that the rate for weight loss was two to three times higher for self-change than for conventional weight loss programs. However, because Schacter's sample was selective and methodology was weak, his study was extensively criticized. Although no further studies have been conducted concerning rates of self change and weight control, much of the research concerning self-change is focused on smoking cessation.

Self-change methods have been found to be used by most successful quitters (Prochaska & DiClemente, 1985). According to Hunt and Matarazzo (as cited in Prochaska et al., 1985), of the individuals attempting to quit smoking using formalized treatment programs, 75% to 80% failed to maintain smoking cessation through the following year. Most of the current smoking cessation research focuses on the use of formal treatments even though 70% to 80% of the 30 million Americans who quit smoking in the last decade, did so using self-change methods (Prochaska et al., 1985). The few studies investigating smoking cessation using self-change have shown that self-changers differ in the processes they use for change as compared to quitters using treatment programs (Prochaska & DiClemente, 1985). More empirical attention diverted to self-change methods may create a better understanding of the self-change process and

can lead to more successful results for changing problem behaviors through enhancement of personal skills, efficient self-help manuals and improved formalized interventions.

Review of Primary Variables

Social Support

It has been shown that poor eating practices by children and adolescents have a lasting negative effect on weight management in adulthood. Eating patterns during formative years are highly predictive of adult obesity, with 80% of obese adolescents becoming obese adults (Mendoca & Brehm, 1983). Just as eating habits are found to have a strong relationship with weight, several studies have discovered a causal linkage between social support and health. House, Robbins, and Metzner (as cited in Gerald, Anderson, Johnson, Hoff & Trimm, 1994) found substantially different mortality risks for socially integrated individuals when compared to those who are socially isolated. It was found that isolated males had a mortality rate two to three times higher than integrated males, and that isolated females' mortality rate was two times higher than for integrated females. Two perspectives proposed by House, Landis, and Umberson (1988) offer alternate explanations for the association between health and social support. The first suggests that relationships promote meaning and coherence to individuals, which directly fosters health. The other view states that relationships facilitate healthy behaviors, such as exercise and diet. In either interpretation, the idea that social support has a beneficial impact on the health status of individuals is upheld.

Foreyt and Goodrick (1994) found that peers and authoritarian figures impart social influence on obese individuals and promote self-management techniques for those attempting to diet. In addition, it was discovered that peers have a positive effect on eating and exercise control when dieters are faced with tempting situations. Their results showed a correlation between social support and dieting success. Researchers concluded that peer groups may help obese individuals become more self-accepting, better deal with self-regulatory crises, and aid in correcting irrational thinking patterns. In a related study by Wallander and Varni (1989), the impact of social support on adjustment levels in chronically ill and handicapped children was investigated. Social support was considered to be a resistance factor to the increased risk of maladjustment and behavior problems of this population which included chronically obese children. The results indicated that children who reported high levels of social support from family and peers showed superior adjustment to those children who reported high levels of social support from only one of these sources. The findings also suggested that social support is an important factor even when gender and age are taken into consideration thus showing that children and adolescents, boys and girls experience benefits from peer and familial social support.

A review of the research on social support indicates that positive relationships among family and peers has several advantageous effects. Mortality rates among males and females not only decrease with higher levels of social support, but positive social influence promotes healthier dieting and exercise behavior as well as lower rates of maladjustment among young individuals battling with weight problems. Thus, social support is a factor with significant influence on the health and well-being of individuals attempting to lose weight.

Self-Efficacy

Bandura (1977) formulated a hypothesis for self-efficacy stating that a person's perceived ability to perform a given task will have a direct impact on future attempts to perform that same task. Self-efficacy mediates the ability to perform a task that is essential to achieving a desired outcome. It follows that an increase in self-efficacy will produce an improved performance on a given task whereas a decrease in self-efficacy will produce a reduction in performance on that same task. Changes in self-efficacy can therefore predict significant and lasting changes in behavior (Velicer, DiClemente, Rossi & Prochaska, 1990). Several studies have found that an increased level of self-efficacy is a reliable predictor for greater weight loss among patients using formalized treatment programs (Wadden & Letizia, 1992). Thus, patients reporting a higher level of confidence in their abilities to comply to a treatment regimen lost more weight than those patients who had less confidence in their abilities. According to Brownell, Marlatt, Lichtenstein, & Wilson (as cited in Clark, Abrams, Niaura, Eaton & Rossi, 1991), low self-efficacy has also been shown to result in poor management of tempting or high risk situations, whereas high self-efficacy relates to successful coping and control in the same conditions. Bernier and Avard (1986) found that higher levels of self-efficacy before weight loss treatment were significantly related to maintenance of weight loss as assessed during a 6-week follow-up.

Cessation and maintenance of smoking behavior have been found to be predicted by levels of self-efficacy (DiClemente, Prochaska, & Gibertini, 1985). Results show that efficacy expectations were highly correlated with subjects' ability to change their smoking

behavior and move through the stages of change from contemplation to maintenance.

DiClemente et al. (1985) also found that self-efficacy was a good predictor of the self-change factors in smoking cessation. Smokers with higher self-efficacy initiated and maintained smoking cessation more often when compared to their cohorts (DiClemente et al., 1985).

Research supports the theory that higher self-efficacy results in a greater ability to perform the behaviors necessary to produce change and achieve a goal. This construct is not only applicable to weight control, but to other problem behaviors as well. Higher self-efficacy levels are indicative of greater success with weight loss, smoking cessation, and have been shown to be predictive of movement through the stages of change.

Decisional Balance

Janis and Mann (1968) proposed a "conflict theory" of decision-making, suggesting the process of decision-making was a series of stages that involve attitude change and scrutiny of motivational processes. The "conflict" arises through the dissonance created by opposing but persuasive aspects of a decisional situation. Their model states that decision-making involves four major types of consequences that categorize the anticipated gains and the anticipated losses of the decision: (1) utilitarian gains and losses for self, (2) utilitarian gains and losses for significant others, (3) self-approval or self-disapproval, and (4) approval or disapproval from significant others (Janis & Mann, 1977). Within this schema, decisional conflicts are viewed in terms of a balance between positive and negative attributes that correspond to anticipated gains and losses for the decision maker. To represent the cognitive and motivational aspects of the

decision making process, Janis and Mann proposed the Decisional Balance Sheet of Incentives (1977). The balance sheet is hypothetically applicable to any important decision and is useful for determining the degree of accuracy with which a decision maker considers all alternatives and consequences of a decision. One of the main assumptions of this schema is that individuals will make a decision based on the idea that gains will exceed any losses. It is emphasized that the absolute amount of gain or loss is not what determines that value of an alternative, but rather, the decision is made on a comparative level.

O'Connel and Velicer (1988) were successful in establishing a more modern version of the decisional balance sheet. They developed the Decisional Balance Measure which assesses the positive aspects (pros) and negative aspects (cons) of the decision to lose weight. Their study tested the idea that decisional balance would be a predictive variable in determining stage of change for weight loss. Results indicated that shifts in comparative value between the positive and negative aspects of weight loss for subjects were predictive of that individual's current stage of change. In a related study that assessed change in smoking status, decisional balance proved to be a reliable construct in predicting change of behavior for smoking cessation (Velicer, DiClemente, Prochaska, & Brandenburg, 1985). Two components of decision making regarding smoking, the Pros of Smoking and the Cons of Smoking, not only differentiated smokers categorized in the various stages of change, but it also predicted movement of smokers from precontemplation to contemplation, and from contemplation to action. It was concluded that when paired with the stages of change model, the decisional balance construct could be used to investigate the cognitive and motivational changes that take place when

attempting to alleviate a health-related problem (Prochaska, Velicer, Rossi, Goldstein, Marcus, Rakowski, Fiore, Harlow, Redding, Rosenbloom, & Rossi, 1994).

Prochaska et al. (1994) suggest that decision making is actually much simpler than Janis and Mann have theorized. They found that the two categories of “pros” and “cons”, clearly represented the types of decisions made regarding behavior change while progressing through the stages of change, and not the eight proposed by Janis and Mann. Research has shown that progressing from precontemplation to action involves an increase in pros and a decrease in cons across a number of problem behaviors (Prochaska et al., 1994).

The pro and con categories that make up the Decisional Balance Measure have been found to encompass the breadth of the decision making construct. Decisional balance has not only been found to be a reliable means for identifying the current stage of change of an individual, but it also has proven to be a predictor of change across many problem behaviors.

CHAPTER III

STATEMENT OF THE PROBLEM

As stated previously, obesity, or the excess of body fat, is an increasingly prevalent problem in the United States (Brownell, 1995). Obese individuals are forced to deal with social biases including prejudice and discrimination and the psychological consequences of self-perception and body image disturbance (Stunkard & Sobal, 1995). In addition, obesity has been linked to a number of medical complications that increase both morbidity and mortality (Pi-Sunyer, 1995). These health problems include diabetes mellitus, hypertension, cardiovascular disease, respiratory dysfunction, and increased occurrence of specific types of cancers. The social, psychological, and medical complications can also be particularly adverse for adolescents. Studies show that obese adolescents meet with less social acceptance and can experience multiple complications with physical growth and function (Dietz, 1995). These problems can be especially difficult for individuals who are developing physically and psychologically. Of particular concern is the fact that childhood and adolescent obesity is a significant predictor of obesity during the adult years (Dietz, 1995).

Many techniques have been employed to treat weight difficulties. These include very-low calorie-diets, commercial diets, exercise, pharmacological treatments, behavioral

approaches and surgical interventions. It is estimated that in 1988, approximately \$4.5 billion was spent on weight reduction programs in medical settings and over \$1.5 billion was spent on nonclinical or commercial programs (Drewnowski, 1995). Unfortunately, studies indicate that many weight loss techniques result in poor long-term maintenance of weight (Wilson, 1995). Follow-up data for many treatment techniques indicate that the majority of subjects return to their pre-treatment weights after five years.

Because the long-term success rates for formalized treatments are low, successful alternatives to these treatments would be valuable to individuals attempting to lose weight as well as to those who have failed to maintain their goal weight after treatment. People who successfully change their weight problems without formalized interventions is one such alternative. Schacter (1982) found that self change rates among individuals attempting to lose weight were between two and three times higher than the success rates for conventional programs. However, little is known about the factors that influence and predict successful self change for obesity.

The purpose of this study was to identify factors that are characteristic of adolescents who lose weight through self-change methods. Specifically, this research focused on the effects of stages of change, social support, self-efficacy, and decisional balance on a person's ability to reduce their weight through self change interventions. Change was monitored by weight differences between the beginning and end of the study and by recording each individual's progression through the stages of change, a series of stages designed to assess how change occurs. The four stages include precontemplation, contemplation, action, and maintenance. The primary hypothesis was that stage of change

will be associated with increased social support, self-efficacy, decisional balance, and weight loss.

Studies have also found that family and friends can promote positive management techniques to overweight individuals through their social influence (Foreyt et al., 1994). In addition, peers have been found to aid dieters in their attempt to maintain control in tempting situations. Overall, studies indicate a correlation between social support and dieting success. Therefore, it was hypothesized that individuals who perceive higher levels of social support from their family and friends would achieve greater weight loss compared to individuals who perceive lower levels of social support.

A third hypothesis involved assessment of each individual's level of perceived self-efficacy. It was hypothesized that individuals in the action and maintenance stages perceive higher levels of weight self-efficacy for achieving weight loss than those in the contemplation stage, and in turn, those in the contemplation stage have a higher sense of weight self-efficacy than those in the precontemplation stage. It is believed that as successful weight loss is achieved, perceived ability to engage in behaviors that are conducive to weight loss increases.

Lastly, it was hypothesized that individuals attempting to change their weight will differ in their decision making approaches depending on their current stage of change. Specifically, individuals in the action stage would view the pros of losing weight exceed the cons compared to those in the precontemplation stage. According to the theory of decisional balance, subjects were hypothesized to make decisions based on two dimensions, the pros and cons of weight loss (Prochaska et al., 1994). It was further hypothesized that subjects who were less likely to change their weight would believe that

the cons of weight loss outweigh the pros. In contrast, it was hypothesized that subjects who believed that the pros of weight control outweigh the cons would be more likely to successfully lose weight .

CHAPTER IV

METHODOLOGY

Participants

Subjects were recruited through consent forms distributed to female college students enrolled in the Introduction to Psychology course and Abnormal Psychology course at Oklahoma State University during the Spring semester of 1997. Because older female adolescents were the target population of this study, only students who were at or below 21 years of age were included. At time of recruitment, no distinction was made between individuals who did and did not have weight concerns. Weight loss techniques that excluded subjects from this study included any use of commercial or formalized treatment programs, prescription drugs, surgery, therapy, and any anorexic or bulimic behaviors as assessed in the demographics questionnaire.

Measures

Demographics.

Subjects were asked to complete a questionnaire requesting demographics information and including questions concerning current weight, perceived ideal weight, weight loss goals, and types of methods to be used to achieve those goals.

Stages of Change Algorithm (SCA)

The SCA (Rossi, Velicer, & Prochaska, 1995) is a brief 4 item self-report questionnaire that assess intentions for weight loss and present activities. Subjects are categorized into one of four distinct categories. Precontemplation includes those individuals who have no intention of losing weight in the next six months. Contemplation includes those who are not actively losing weight but are earnestly considering losing or controlling weight in the next four months. Action includes those who are losing or controlling weight or have successfully lost weight within the last four months. Maintenance includes those who have maintained their weight loss during the Spring semester. No reliability data is available on the Stages of Change Algorithm but the construct has been found to be reliable across a range of other problem behaviors.

Perceived Social Support Measures (PSS)

The PSS (Prociando & Heller, 1983) measures are 20-item measures designed to assess the extent of perceived support, information, and feedback a person perceives from their friends (PSS-Fr) and family (PSS-Fa). The distinction between friends and family is made because different populations rely on their friends and family for support to different extents. The two scales are 20-item assessments using a three-point answer format of yes, no, and do not know. Both measures have proven to be homogenous measures with a Cronbach's alpha of .90 while the PSS-Fr scale was found to have relatively high internal consistency (alpha = .84).

Decisional Balance Inventory (DBI)

The DBI (Rossi et al., 1995) is a 20 item measure designed to assess two dimensions of decision making for controlling weight, the pros and cons of weight loss. It is theorized that evaluation of the pros and cons of changing weight loss behavior depends on motivational readiness to change. The two scales of this measure contain 10 items each that are scored using a 5-point Likert scale format. Reliability for the DBI resulted in a coefficient alpha of .91 for the pros scale and .84 for the cons scale.

Weight Efficacy Life-Style Questionnaire (WEL)

The WEL (Rossi et al., 1995) is a 20 item measure designed to assess five dimensions of efficacy for weight management: availability, negative emotions, physical discomfort, positive activities, and social pressure. The measure consists of five subscales that can be added for a total or mean score. The WEL is scored on a 10-point format where higher scores indicate greater confidence to resist overeating in tempting situations. Reliability for the WEL resulted in high reliability ($\alpha = .91$). The model this measure is based on assumes that efficacy is closely tied to motivational readiness to change, thus increasing from precontemplation to maintenance.

Procedure

Each participant ($M = 19$ years; $SD = .91$) was asked to complete a demographic questionnaire as well as the five other measures during the pre-test phase of the study.

From an original group of 115 subjects, 31 were excluded due to incomplete information

at Time 2. None of the subjects had to be excluded due to reported purging behavior. The sample of 84 participants included 64% freshmen, 21% sophomores, 12% juniors, and 1% seniors. The pre-test questionnaires were completed during January of the 1997 semester. At Time 2, the stages of change algorithm were completed again, post-test, four months later. At Time 1 and Time 2, weights were recorded by both self-report and by weight scale to account for perceived and actual weight lost during the study.

CHAPTER V

RESULTS

Descriptive Statistics and Zero

Order Correlations

The means and standard deviations for each of the primary dependent variables (WTLoss = weight loss (weight at Time 1 - weight at Time 2); WELSum = weight efficacy; DBIDiff = decisional balance ; FATotal = family social support; FRTotal = friends social support) at each stage of change for Time 1 and Time 2 are presented in Table 1.

Initial analyses included construction of a correlation matrix using demographic information and the primary variables of interest (see Table 2). Examination of these correlations revealed that family social support was significantly correlated with friends social support, $r = .19$, $p < .05$. Notably, weight loss was inversely correlated with family social support, $r = -.21$, $p < .05$, with less weight loss associated with higher social support. Weight self-efficacy was significantly related to both the decisional balance and friends social support ($r = .26$, $p < .01$, and $r = .17$, $p < .05$), respectively, with higher levels of weight self-efficacy associated with endorsement of pros for losing weight and higher levels of friends social support. Notably, no other variable was significantly associated with weight loss.

Table 1

Means and Standard Deviations for Primary Variables at Stage of Change for Time 1 and 2

Measures	TIME 1 Stage of Change							
	I n=14		II n=11		III n=30		IV n=29	
	M	SD	M	SD	M	SD	M	SD
WTLoss	1.50	3.49	2.18	5.63	1.07	4.42	2.45	3.46
WELSum	127.60	28.69	119.30	21.95	125.2	23.91	129.8	30.10
DBIDiff	2.00	8.72	8.18	9.09	13.77	8.42	8.31	12.32
FATotal	13.50	4.82	14.27	3.17	14.33	6.96	14.90	3.71
FRTTotal	15.29	4.41	18.09	2.59	15.53	4.19	15.96	3.26

Measures	TIME 2 Stage of Change							
	I n=11		II n=13		III n=30		IV n=30	
	M	SD	M	SD	M	SD	M	SD
WTLoss	2.81	4.00	2.00	5.37	2.30	4.64	0.97	3.01
WELSum	117.4	30.08	125.5	24.64	126.3	21.66	130.46	30.46
DBIDiff	-3.09	6.50	12/62	7.52	14.13	8.42	7.07	10.95
FATotal	13.82	4.33	15.92	8.20	13.33	4.87	14.70	4.13
FRTTotal	15.45	3.96	17.31	3.40	16.03	3.44	15.43	4.20

Note: Measures: WTLoss = weight loss
 WELSum = weight efficacy
 DBIDiff = decisional balance
 FATotal = family social support
 FRTTotal = friends social support

State of Change: I = Pre-contemplation
 II = Contemplation
 III = Action
 IV = Maintenance

Table 2

Correlations among Variables of Interest and Demographic Variables

	Age	WTLoss	WELSUM	DBIDiff	FATotal	FRTotal
Age	--					
WTLoss	-.01	--				
WELSUM	.11	.06	--			
DBIDiff	.02	.02	.26**	--		
FATotal	.09	-.21*	.09	.16	--	
FRTotal	.08	-.04	.17*	.14	.19*	--

Note. Measures: WTLoss = weight loss
WELSum = weight efficacy
DBIDiff = decisional balance
FATotal = family social support;
FRTotal = friends social support.

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

Hypothesis 1

Multivariate analysis of variance (MANOVA) was used to test the hypothesis that an individual's stage of change, specifically those in the action stage or those who move from the contemplation to action stage, would be associated with increased social support, self-efficacy, decisional balance, and weight loss. Scores for individuals included in the action stage at Time 1 and Time 2 and individuals who moved from contemplation at Time 1 to action at Time 2 were collapsed into one group (Group 1), and were compared to scores for all other subjects (Group 2). Univariate tests showed that individuals in Group 1 endorsed more pros for losing weight compared to those in Group 2, $t(85) = 2.82$, $p < .01$. No other significant effects were found. Thus, being in the action stage or moving from contemplation to action was not associated with social support, self-efficacy, or weight loss.

Hypothesis 2

Pearson product-moment correlations were calculated to test the hypothesis that individuals who perceive higher levels of social support from their family and friends will achieve greater weight loss compared to individuals who perceive lower levels of social support (Table 2). As noted previously, results showed a significant correlation between family social support and weight loss, however, these variables revealed an inverse relationship, $r = -.21$, $p < .05$. Thus, higher social support was associated with lower amounts of weight loss. No significant relationship was revealed for weight loss and friends social support.

Hypothesis 3

A one way analysis of variance (ANOVA) was conducted to answer the third hypothesis that individuals in the action and maintenance stages perceive higher levels of weight self-efficacy for achieving weight loss than those in the contemplation stage, and in turn, those in the contemplation stage have a higher sense of weight self-efficacy than those in the precontemplation stage. Subjects in each of the four stages of change were compared on their weight self-efficacy scores at both Time 1 and Time 2.

At Time 1, the one-way ANOVA comparing action and maintenance to contemplation was nonsignificant, $t(42) = .36, p > .05$. Additionally, the ANOVA comparing contemplation to precontemplation was also nonsignificant, $t(25) = .50, p > .05$. Thus, analysis at Time 1 revealed no significant difference in weight self-efficacy across the four stages of change.

Similarly, at Time 2, significance was not found for the one-way ANOVAs, $t(76) = .53, p > .05$, and $t(22) = .73, p > .05$, respectively. Overall, results did not support the hypothesis that those in the action and maintenance stages had a higher level of perceived self-efficacy for weight loss than those in the contemplation stage. In addition, those in the contemplation stage also did not show higher weight self-efficacy than those in the precontemplation stage.

Hypothesis 4

A MANOVA was conducted to answer the final hypothesis that individuals in the action stage view the pros of losing weight outweighing the cons, compared to those in

the precontemplation stage. Subjects' scores on the decisional balance measure were compared across the four stages of change at both Time 1 and at Time 2.

At Time 1, mean comparisons indicated a significant difference between Stage 1 (Precontemplation) and Stage 3 (Action) for the DBIDiff variable at Time 1, $t(43) = 4.21$, $p < .01$. Thus, at Time 1, subjects in the Action stage found the pros, or positive effects, of weight loss to exceed the cons, or drawbacks. These subjects differed significantly from subjects in the Precontemplation stage, who indicated that the cons of weight loss exceeded the pros.

At Time 2, mean comparisons indicated significant differences between Stage 1 (Precontemplation) and Stage 2 (Contemplation), $t(22) = .542$, $p < .01$, Stage 3 (Action), $t(41) = 6.51$, $p < .01$, and Stage 4 (Maintenance), $t(39) = 2.88$, $p < .01$ and between Stage 3 and Stage 4, $t(60) = 2.88$, $p < .01$. Results indicate that at Time 2, subjects in the Precontemplation stage believed that the cons of weight loss exceeded the pros. Subjects in this stage differed significantly from subjects in all other stages of change on the decisional balance factor. In addition, these findings also indicate that although the pros for weight loss exceed the cons for individuals in both the Action and Maintenance stages, subjects in the Action stage indicated the pros outweighed the cons to a significantly higher degree than those in the Maintenance stage.

Exploratory Analyses

Due to shared variance among the primary variables, multiple regression analysis was conducted to determine the relative contributions of family social support (FATotal), friends social support (FRTotal), weight efficacy (WELSum), and decisional balance

(DBIDiff) to weight loss, beyond the effects of stage of change at Time 1 and 2. The hierarchical multiple regression equation included entry of weight at Time 1 (REALWT) on step 1, stage of change at Time 1 on step 2, stage of change at Time 2 on step 3, and the variables FATotal, WELSum, FRTotal, and DBIDiff were simultaneously entered on step 4 (see Table 3).

Results of the regression indicated that neither stage of change at Time 1 or 2 was a significant predictor of weight loss. Results revealed, however, a significant contribution for FATotal, $t = -2.12$, $p < .04$. The negative t value indicates an inverse relationship between family social support and weight loss, with a lower levels of perceived family social support associated with more weight loss. Thus, this finding suggests that a higher level of perceived family social support is not associated with increased weight loss, but that an inverse relationship exists between these variables.

A significant contribution was also found for WELSum, $t = 2.31$, $p < .03$, indicating that higher perceived efficacy for losing weight was associated with increased weight loss.

Table 3

Hierarchical Multiple Regression Analysis Examining Weight Loss, Stage of Change at Time 1 and 2, and the Primary Variables

Step	Variable	β	DF	t	R ² Change for step	F Change for step	Significant change
1	REALWT	.02			.01	.02	.88
2	Stage of Change Time 1		5,62		.04	.70	.58
	SOCA1	.10		.64			
	SOCA2	-.14		-.97			
	SOCA3	-.20		-1.17			
	SOCA4	-.01		-.08			
3	Stage of Change Time 2		9,58		.01	.17	.95
	SOCA1X2	.04		.26			
	SOCA2X2	.05		.29			
	SOCA3C2	.09		.55			
	SOCA4X2	-.03		-.14			
4	Primary Variables		13.54		.15	2.521*	.05
	DBIDiff	.17		1.02			
	FRTotal	-.11		-.83			
	FATotal	-.28		-2.12*			
	WELSum	.31		2.31			

Note: Measures: REALWT = weight at time 1
 WELSum = weight efficacy
 DBIDiff = decisional balance
 FATotal = family social support
 FRTotal = friends social support
 SOCA = stage of change

* $p < .05$

CHAPTER VI

DISCUSSION

The present study examined factors that predict successful self-change in college women attempting to lose weight. The primary purpose was to identify variables associated with the ability to lose weight. Specifically, this investigation examined whether stage of change, level of perceived social support from both family and friends, self-efficacy, and decisional balance predicted successful weight loss outcome over a four month period of time. The stages of change model, which breaks down the process of behavior change into a series of four discrete stages, was used to theoretically guide the current research.

A MANOVA was conducted to answer the primary hypothesis that an individual's stage of change, specifically those in the action stage or those who move from the contemplation to action stage, would be associated with increased social support, self-efficacy, decisional balance, and weight loss. Results indicated that subjects in these stages did respond with greater endorsement of pros for weight loss as compared to subjects in all other stages of change combined. This finding is consistent with the results of O'Connell and Velicer (1988), who found decisional balance scores to be a reliable indicator of an individual's current stage of change. However, increased social support, self-efficacy, and weight loss were not found to be associated with stage of change.

Correlational analyses indicated a significant relationship between family social support and weight loss. Contrary to prediction, results showed that as family social support increased, weight loss decreased, thus indicating an inverse relationship between these two variables. Such findings suggest that if perceived family support and acceptance are high, satisfaction with existing weight may also increase. Thus, family support may actually diminish the desire to lose weight, and/or decrease motivation to lose weight. Although speculative, these findings suggest that an individual may be more comfortable with their given weight when family support is high. This is consistent with the finding that social support is considered to be a resistance factor to various types of distress and maladjustment (e.g. Wallander & Varni, 1989; House et al., 1988; Foreyt & Goodrick, 1994).

In addition, findings also did not support the hypothesis that those in the Action and Maintenance Stages would perceive higher self-efficacy than those in the Contemplation Stage, and those in the Contemplation Stage would have higher self-efficacy than those in the Precontemplation Stage. The reasons for the lack of relationship between these variables is unclear, however, a number of speculations can be made. Self-efficacy was chosen as a factor in this study because of its documented role in mediating the ability to achieve a desired outcome (DiClemente et al., 1985). However, different methods of assessing self-efficacy were utilized in the current study as compared to DiClemente (1995). Our evaluation of self-efficacy involved using a measure that assessed five hypothesized dimensions of efficacy: negative emotions, availability, social pressure, physical discomfort, and positive activities. Comparatively, DiClemente et al. (1985) utilized an efficacy measure comprised of only two dimensions: temptation (cue

strength) and confidence (efficacy). In addition, DiClemente et al. (1985) focused on efficacy and its effects on smoking behavior, not weight loss, in a subject pool comprised of adults who began smoking as teen-agers and had a mean age of 40 years. Thus, not only was there a significant contrast in sample populations and target problems, but differing assessment measures may actually have measured different constructs and resulted in dissimilar findings.

The current results also indicated that scores on the decisional balance scale were significantly different by stages of change at Time 1 and 2. At Time 1, individuals in the Precontemplation Stage (Stage 1) had significantly lower scores on the decisional balance scale than did individuals in the Action Stage (Stage 3). This indicated that the positive consequences for losing weight notably exceeded the negative consequences for individuals in the Action Stage. Those in the Precontemplation Stage did not endorse this position, indicating that cons for losing weight exceeded the pros. Similar results were obtained for the Time 2 analysis. Individuals in the Precontemplation Stage had significantly lower scores for decisional balance as compared to the Contemplation (Stage 2), Action (Stage 3), and Maintenance (Stage 4) Stages. Data revealed that the Precontemplation Stage group viewed the negative outcomes of weight loss as exceeding the positive outcomes, whereas those in the Contemplation, Action, and Maintenance Stages endorsed more positive than negative consequences. In addition, results showed that individuals in the Action Stage had significantly higher scores on the decisional balance scale as compared to those in the Maintenance Stage at Time 2. These results suggest that individuals who were actively attempting to lose weight believed that the rewards of weight loss surpassed the drawbacks to a greater extent than those who were

maintaining their weight. These results are consistent with the stages of change model, which suggests that as individuals progress through the stages, the pros for weight loss will increase as they move into the Action Stage (O'Connell & Velicer, 1988). Notably, the results did not support the hypothesis that individuals in the Action Stage would report higher levels of social support when compared to individuals in the Precontemplation Stage.

A multiple regression analysis was conducted to examine the relative contributions of social support, self-efficacy, decisional balance, and weight loss beyond the effects of stage of change at Time 1 and 2. Notably, results indicated that the stage of change did not predict weight loss. Although the reasons for this finding are uncertain, a number of speculations can be made. The stage of change model has been found to be predictive of various types of behavior change, however, the majority of the literature focuses on smoking cessation (DiClemente et al., 1991; Prochaska, Velicer, Guadagnoli, Rossi, & DiClemente, 1991). Smoking cessation research related to the stages of change typically focuses on temptations to smoke, which although related, differs from focusing on temptations to eat (Prochaska et al., 1985). Much of the cessation research also centers on recidivism and how to control drop out rates from smoking cessation groups (Schachter, 1982). Comparatively, weight loss research related to the stages of change typically includes reference to body image, weight dissatisfaction, emotional status, and health considerations (Kirschenbaum et al., 1992; Brownell & Wadden, 1992). Thus, studies concerning weight loss may involve quite different factors and processes in comparison to smoking cessation.

Results of the analysis also revealed a significant relationship only between weight loss, weight self efficacy, and family social support. Thus, more weight was lost by those who believed they could effectively lose weight than by those who did not express efficacy in their weight loss abilities over the duration of this study. These findings are consistent with the results of Wadden and Letizia (1992), who also found self-efficacy to be a reliable predictor of increased weight loss, with higher levels of self-efficacy indicative of readiness to change. The results also indirectly support the findings that low self-efficacy relates to poorer control and coping in tempting situations that challenge weight management, including social pressure, physical discomfort, and negative emotions (Clark et al., 1991).

Results indicated no significant relationship between decisional balance and weight loss. These findings stand in contrast to those of O'Connell and Velicer (1988) who uncovered an association between decisional balance factor and stage of change for weight loss. However, unlike the current study, O'Connell and Velicer (1988) did not measure weight loss per se in their study, but rather established decisional balance as factor for determining stage of change on a population of individuals intending to lose weight. Thus, the discrepancy in the current findings may be due to fundamental differences between these two studies. The present study measured weight loss over a four month time period and assessed decisional balance and stage of change at the beginning and stage of change at the end of the four months. O'Connell and Velicer (1988), however, did not measure weight loss but rather assessed decisional balance and self reported action regarding weight loss. Prediction of stage of change was then determined from decisional balance scores and self-description. Thus, the lack of association found between decisional balance and weight loss in the present study may be directly due to methodological

differences. Further investigation in this area is called for as it concerns the relationship between weight loss, stage of change, and decisional balance.

A similar argument can be posed for the lack of relationship between social support and stage of change. Although high levels of social support have been found to relate to dieting success (Foreyt & Goodrick, 1994), quite different measures were utilized. For example, Gerald et al. (1994) conducted a study focusing on obesity risk in children and social support. The type of social support assessment Gerald et al. utilized differed remarkably from the present study and included measurement of expressive social support, instrumental support (help received from others), and quantity of support providers. The measure used in the current study assessed aspects of relations between friends and family, including moral and emotional support. Thus, the lack of significant findings between this model and social support suggest that alternative measurement methods may have been influential.

There are several limitations in the present investigation. First, the current study focused on a non-clinical population and thus, may not generalize to all individuals who attempt to lose weight. A population composed of clinically overweight and obese females may have produced much different results due to differing levels of motivation and greater need for weight loss. For example, obese individuals who have co-existing medical conditions may evidence considerably more motivation to lose weight (Fettes & Williams, 1996). Further research is needed to establish the predictors of weight loss that may be specific to clinical and non-clinical populations of individuals desiring weight loss.

Second, the sample size used in this investigation was relatively small. The limited number of individuals successfully completing this study resulted in even smaller numbers

of subjects in each of the stages of change. Individuals categorized in one of the four stages of change at Time 1 had the capability of moving to any of the other four stages of change at Time 2. This resulted in sixteen possible groups into which subjects could be categorized. Thus, the limited number of subjects allowed for few of the groups to have membership adequate for analysis. Future studies need to include increased numbers of subjects in order to enhance the likelihood of detecting significant differences between these groups.

Third, the current results may have been influenced by the relatively limited amount of time available for achieving weight loss. A longer time period may have allowed subjects to progress further through the stages of change and may have resulted in larger differences between starting and ending weights of the subjects. Further research must allow increased time for behavior change, especially when considering weight loss.

Finally, a limited number of variables were considered in this study. Other salient factors may have influenced the results, including emotional factors such as depression, anxiety, motivation, and stress, all of which may influence changes in weight (Foreyt et al., 1995). In addition, physiological factors (i.e., metabolism and activity level) were not considered in this study, which often have been associated with success in weight loss (Brownell, 1995).

In conclusion, the present findings have meaningful implications for individuals attempting to lose weight and for those who treat them. The significant relationship between weight loss and high self-efficacy suggests that intervention efforts should focus on enhancing this cognitive dimension. Increased levels of self-efficacy appear to increase attainment of goals, and strengthen lasting changes in behavior, in addition to heightening

weight loss results (Velicer et al., 1990; Wadden & Letizia, 1992). The interesting finding of an inverse relationship between social support and weight loss suggests further examination of this association. Although House et al. (1988) suggest that familial and interpersonal relationships foster purpose and cohesion among individuals, and in turn, foster health, further investigations may need to focus on the function that family systems play on the weight satisfaction of family members.

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APPENDIXES

APPENDIX A

DEMOGRAPHICS

Background Information

(All information will be kept confidential)

Today's Date _____

Subject Number _____

W _____

1. Age _____

2. Educational Classification: Freshman
 Sophomore
 Junior
 Senior
 Other _____

3. Height: _____ Ft. _____ In.

4. Weight: _____ pounds.

5. Are you satisfied with your current weight? Yes No

6. Would you prefer to lose or gain weight? Lose Gain N/A

7. What is your preferred weight if different from your current weight? _____ pounds.

8. If losing weight is a goal of yours:

A. How much weight would you like to lose? _____ pounds.

B. How much weight could you lose in the next four months (this semester)?
 _____ pounds.

9. What weight loss methods, if any, have you used or are you using? (Circle one)

- A. Commercial diet (Weight Watchers, NutraSystem, etc.)
- B. Formalized exercise program (personal training, etc.)
- C. Prescribed medication
- D. Over the counter drugs (diet pills, laxatives, etc.)
- E. Surgery
- F. Exercise (on your own)
- G. Dieting (on your own)
- H. Purging (throwing up food)
- I. Fasting (severely restricting food)
- J. Other (please specify)

10. What weight loss methods would you use if you attempted to lose weight in the next four months (this semester)?

- A. Commercial diet (Weight Watchers, NutraSystem, etc.)
- B. Formalized exercise program (personal training, etc.)
- C. Prescribed medication
- D. Over the counter drugs (diet pills, laxatives, etc.)
- E. Surgery
- F. Exercise (on your own)
- G. Dieting (on your own)
- H. Purging (throwing up food)
- I. Fasting (severely restricting food)
- J. Other (please specify)

APPENDIX B

STAGES OF CHANGE ALGORITHM

Directions: Circle the best answer for each of the following questions.

- | | | |
|--|-----|----|
| 1. In the past month, have you been actively trying to lose weight? | YES | NO |
| 2. In the past month, have you been actively trying to keep from gaining weight? | YES | NO |
| 3. Are you seriously considering trying to lose weight to reach your goal weight in the next 6 months? | YES | NO |
| 4. Have you maintained your desired weight for more than six months? | YES | NO |

APPENDIX C

PERCEIVED SOCIAL SUPPORT

Directions: The statements which follow refer to feelings and experiences which occur to most people at one time or another in their relationships with friends and family of origin (mother, father, siblings). For each statement there are three possible answers for friends and three for family. Yes, No, Don't Know (DK). Please circle the answer you choose for each item for friends and then for family

<u>Friends</u>			<u>Family</u>			
Yes	No	DK	Yes	No	DK	1. My friends (family) give me the moral support I need.
Yes	No	DK	Yes	No	DK	2. Most other people are closer to their friends (family) than I am.
Yes	No	DK	Yes	No	DK	3. My friends (family) enjoy hearing about what I think.
Yes	No	DK	Yes	No	DK	4. Certain friends (family members) come to me when they have problems or need advice.
Yes	No	DK	Yes	No	DK	5. I rely on my friends (family) for emotional support.
Yes	No	DK	Yes	No	DK	6. If I felt that one or more of my friends (family members) were upset with me, I'd just keep it to myself
Yes	No	DK	Yes	No	DK	7. I feel that I'm on the fringe in my circle of friends (family members).
Yes	No	DK	Yes	No	DK	8. There is a friend (family member) I could go to if I were just feeling down, without feeling funny about it later.
Yes	No	DK	Yes	No	DK	9. My friends (family) and I are very open about what we think about things.
Yes	No	DK	Yes	No	DK	10. My friends (family) are sensitive to my personal needs.
Yes	No	DK	Yes	No	DK	11. My friends (family) come to me for emotional support.
Yes	No	DK	Yes	No	DK	12. My friends (family) are good at helping me solve problems.
Yes	No	DK	Yes	No	DK	13. I have a deep sharing relationship with a number of friends.

Yes No DK Yes No DK

14. My friends (family) get good ideas about how to do things or make things from me.

Yes No DK Yes No DK

15. When I confide in friends (family), it makes me feel uncomfortable.

Yes No DK Yes No DK

16. My friends (family) seek me out for companionship.

Yes No DK Yes No DK

17. I think that my friends (family) feel that I'm good at helping them solve problems.

Yes No DK Yes No DK

18. I don't have a relationship with a friend that is as intimate as other people's relationships with friends.

Yes No DK Yes No DK

19. I've recently gotten a good idea about how to do something from a friend (family member).

Yes No DK Yes No DK

20. I wish my friends (family) were much different.

APPENDIX D

WEIGHT EFFICACY LIFE-STYLE

QUESTIONNAIRE

This form describes some typical eating situations. Everyone has situations which makes it very hard for them to keep their weight down. The following are a number of situations relating to eating patterns and attitudes. This form will help you to identify the eating situations which you find the hardest to manage.

Read each situation listed below and decide how confident (or certain) you are that you will be able to resist eating in each of the difficult situations. In other words, pretend that you are in the eating situation right now. On a scale from 0 (not confident) to 9 (very confident), choose ONE number that reflects how confident you feel now about being able to *successfully resist* the desire to eat. Write this number down next to each item.

Not confident at all that you can
resist the desire to eat

Very confident that you can
resist the desire to eat

0 1 2 3 4 5 6 7 8 9

EXAMPLES

I AM CONFIDENT THAT

CONFIDENCE NUMBER

1. I can control my eating on weekends.

_____ 8 _____

2. I can say "no" to snacks.

_____ 6 _____

I AM CONFIDENT THAT:

1. I can resist eating when I am anxious (nervous).

2. I can control my eating on the weekends.

3. I can resist eating even when I have to say "no" to others.

4. I can resist eating when I feel physically run down.

5. I can resist eating when I am watching TV.

6. I can resist eating when I am depressed (or down).

7. I can resist eating when there are many different kinds of food available.

8. I can resist eating even when I feel it is impolite to refuse a second helping. _____
9. I can resist eating even when I have a headache. _____
10. I can resist eating when I am reading. _____
11. I can resist eating when I am angry (or irritable). _____
12. I can resist eating even when I am at a party. _____
13. I can resist eating even when others are pressuring me to eat. _____
14. I can resist eating when I am in pain. _____
15. I can resist eating just before going to bed. _____
16. I can resist eating when I have experienced failure. _____
17. I can resist eating even when high-calorie foods are available. _____
18. I can resist eating even when I think others will be upset if I don't eat. _____
19. I can resist eating when I am uncomfortable. _____
20. I can resist eating when I am happy. _____

APPENDIX E

DECISIONAL BALANCE INVENTORY

Directions: Each statement represents a thought that might occur to a person who is deciding whether or not to lose weight. Please indicate how IMPORTANT each of these statements might be to you if you were considering a decision to lose weight. There are FIVE, possible responses to each of the items that reflect your answer to the question "How important would this be to you?" Circle the number that best describes how important each statement would be to you if you were deciding whether or not to lose weight.

- 1 = not important at all
 2 = slightly important
 3 = moderately important
 4 = very important
 5 = extremely important

- | | |
|-------------------|--|
| 1 2 3 4 5 | 1. The exercises needed for me to lose weight would be a drudgery. |
| 1 2 3 4 5 | 2. I would feel more optimistic if I lost weight. |
| 1 2 3 4 5 | 3. I would be less productive in other areas if I was trying to lose weight. |
| 1 2 3 4 5 | 4. I would feel sexier if I lost weight. |
| 1 2 3 4 5 | 5. In order to lose weight I would be forced to eat less appetizing food. |
| 1 2 3 4 5 | 6. My self-respect would be greater if I lost weight. |
| 1 2 3 4 5 | 7. My dieting could make meal planning more difficult for my family or house-mates. |
| 1 2 3 4 5 | 8. My family would be proud of me if I lost weight. |
| 1 2 3 4 5 | 9. I would not be able to eat some of my favorite foods if I were trying to lose weight. |
| 1 2 3 4 5 | 10. I would be less self-conscious if I lost weight. |
| 1 2 3 4 5 | 11. Dieting would take the pleasure out of meals. |
| 1 2 3 4 5 | 12. Others would have more respect for me if I lost weight. |
| 1 2 3 4 5 | 13. I would have to cut down on some of my favorite activities if I try to lose weight. |
| 1 2 3 4 5 | 14. I could wear more attractive clothing if I lost weight. |
| 1 2 3 4 5 | 15. I would have to avoid some of my favorite places if I were trying to lose weight. |

- | | | | | | |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 16. My health would improve if I lost weight. |
| 1 | 2 | 3 | 4 | 5 | 17. Trying to lose weight could end up being expensive when everything is taken into account. |
| 1 | 2 | 3 | 4 | 5 | 18. I would feel more energetic if I lost weight. |
| 1 | 2 | 3 | 4 | 5 | 19. I would have to cut down on my favorite snacks while I was dieting. |
| 1 | 2 | 3 | 4 | 5 | 20. I would be able to accomplish more if I carried fewer pounds. |

APPENDIX F

IRB APPROVAL FORM

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
HUMAN SUBJECTS REVIEW

Date: 01-31-97

IRB#: AS-97-043

Proposal Title: PREDICTORS OF SELF-CURE AMONG OVERWEIGHT
COLLEGE STUDENTS USING THE STAGES OF CHANGE MODEL

Principal Investigator(s): Larry L. Mullins, Karen M. Aniol

Reviewed and Processed as: Expedited

Approval Status Recommended by Reviewer(s): Approved

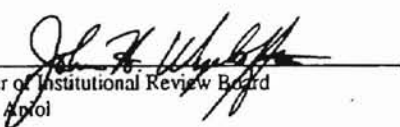
ALL APPROVALS MAY BE SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD
AT NEXT MEETING, AS WELL AS ARE SUBJECT TO MONITORING AT ANY TIME DURING
THE APPROVAL PERIOD.

APPROVAL STATUS PERIOD VALID FOR DATA COLLECTION FOR A ONE CALENDAR YEAR
PERIOD AFTER WHICH A CONTINUATION OR RENEWAL REQUEST IS REQUIRED TO BE
SUBMITTED FOR BOARD APPROVAL.

ANY MODIFICATIONS TO APPROVED PROJECT MUST ALSO BE SUBMITTED FOR
APPROVAL.

Comments, Modifications/Conditions for Approval or Disapproval are as follows:

Signature:


Chair of Institutional Review Board

cc: Karen M. Aniol

Date: February 7, 1997

VITA

Karen M. Aniol

Candidate for the Degree of

Master of Science

Thesis: PREDICTORS OF WEIGHT LOSS USING SELF CHANGE METHODS
AMONG COLLEGE STUDENTS

Major Field: Psychology

Biographical:

Personal Data: Born in Columbia, Missouri on March 22, 1972, the daughter of Larry and Jo Ann Aniol.

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