



12-1-2002

Longitudinal Predictors of Weight Fluctuation in Men and Women

Kelly L. Bishop

Follow this and additional works at: <https://commons.und.edu/theses>

Recommended Citation

Bishop, Kelly L., "Longitudinal Predictors of Weight Fluctuation in Men and Women" (2002). *Theses and Dissertations*. 1068.
<https://commons.und.edu/theses/1068>

This Dissertation is brought to you for free and open access by the Theses, Dissertations, and Senior Projects at UND Scholarly Commons. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of UND Scholarly Commons. For more information, please contact zeinebyousif@library.und.edu.

LONGITUDINAL PREDICTORS OF WEIGHT FLUCUATION IN MEN AND WOMEN

by

Kelly L. Bishop
Master of Arts, University of North Dakota, 1999

A Dissertation

Submitted to the Graduate Faculty

of the

University of North Dakota

in partial fulfillment of the requirements


for the degree of

Doctor of Philosophy

Grand Forks, North Dakota
December
2002

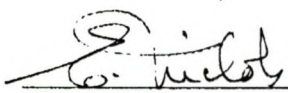
T2002
B6225

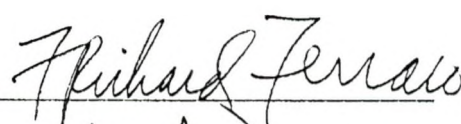
This dissertation, submitted by Kelly L. Bishop in partial fulfillment of the requirements for the Degree of Doctor of Philosophy from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done and is hereby approved.

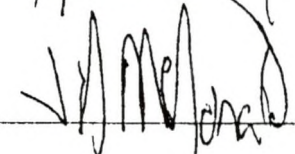


(Chairperson)

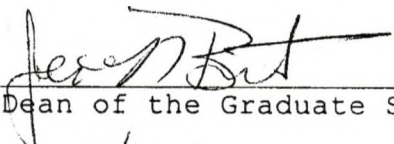








This dissertation meets the standards for appearance, conforms in the style and format of the Graduate School of the University of North Dakota, and is hereby approved.



Dean of the Graduate School

8/27/01
Date

PERMISSION

Title Longitudinal Predictors of Weight Fluctuation
 in Men and Women

Department Psychology

Degree Doctor of Philosophy

In presenting this dissertation in partial fulfillment of the requirements for a graduate degree from the University of North Dakota, I agree that the library of this University shall make it freely available for inspection. I further agree that permission for extensive copying for scholarly purposes may be granted by the professor who supervised my dissertation work, or in his absence, by the chairperson of the department or the Dean of the Graduate School. It is understood that any copying or publication or other use of this dissertation or part thereof for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to the University of North Dakota in any scholarly use which may be made of any material in my dissertation.

Signature

Kelly L. Bishop

Date

8/13/01

TABLE OF CONTENTS

LIST OF TABLES.....v

ACKNOWLEDGMENTS.....vii

ABSTRACT.....ix

CHAPTER

 I. INTRODUCTION.....1

 II. METHOD.....33

 III. RESULTS.....53

 IV. DISCUSSION.....80

APPENDICES.....103

REFERENCES.....139

LIST OF TABLES

Table	Page
1. Weight-related Demographic Information for the Normal Sample.....	55
2. Standardized Canonical Discriminant Function Coefficients.....	59
3. Group Centroids for Function 1.....	60
4. Classification Results.....	61
5. Cross-validation Classification Results.....	61
6. Standardized Canonical Discriminant Function Coefficients.....	63
7. Group Centroids for Function 1.....	64
8. Classification Results.....	65
9. Cross-validation Classification Results.....	65
10. Pre- and Post-Speech Mood Measure Scores for Relaxed/Stressed and Calm/Nervous Items.....	66
11. Correlations of Weight Change and Amount of Candy Eaten in Lab with Weight-related Demographics, Hassles, Dieting Behavior, Depression, and Laboratory Coping.....	67
12. Correlations of 6-mt Weight Change and Depression Scores in Weight Cyclers and Non-Weight Cyclers.....	69
13. Correlations of General Life Stress with Weight-related Demographics, Dieting Behavior, and Depression.....	70

Table	Page
14. Weight-related Demographic Information for the Weight Loss Sample.....	72
15. Correlations of Weight Change with Weight-related Demographics, Dieting Behavior, and Depression in Weight-loss Maintainers.....	75
16. Correlations of 6-mt Weight Change and Depression Scores in Weight Cyclers and Non-Weight Cyclers in Weight-Loss Maintainers.....	77
17. Correlations of Weight-related Demographics with Dieting Behavior and Depression in Weight-loss Maintainers.....	77

ACKNOWLEDGMENTS

I wish to express my sincere appreciation to Dr. Jeff Holm, my academic advisor and dissertation chairperson. Because of his direction and guidance through all phases of this project, Dr. Holm is recognized as an important contributor to this dissertation. I appreciate his assistance in generating ideas and the critical feedback that he provided on all drafts of this paper. His contribution in the area of data analysis was also profound (I wasn't sure this part would end!).

I would also like to thank Dr. Ric Ferraro, Dr. Nancy Vogeltanz-Holm, Dr. Doug McDonald, Dr. Andrea Zevenbergen, and Dr. Elizabeth Nichols, my committee members, for their input on various aspects of this project. Their suggestions served to facilitate the development and completion of this dissertation.

I would additionally like to thank Dr. Ric Ferraro for his support and encouragement of my graduate teaching and research activities. I've enjoyed working with and getting to know him over the past few years and hope to have the opportunity to collaborate with him on future projects.

In addition, I would like to thank my family and friends who have been supportive of my educational pursuits. First and foremost, I wish to thank my parents, John and Cindy Bishop, without whom this dissertation would not exist. They have provided me with unwavering love and support, instilled in me the value of hard work, and always encouraged me to follow my dreams. While I am often reminded of how proud they are of my academic achievements, it has been reassuring to know that they would have been supportive of any other paths I had chosen. Thanks Mom and Dad.

I also wish to thank Dana Scheurer, my best friend and colleague, for being a great person and an invaluable source of support over the years. It has been a blast having the opportunity to attend high school, college, and grad school together. Can you believe we are finally almost finished?!

Finally, I want to thank my fiance, Vincent Diaz, for his love, emotional support, and incredible patience. He always knows how to lift my spirits and provides me with endless encouragement. I appreciate the many ways in which he has helped make this endeavor possible.

ABSTRACT

Previous literature has indicated that weight loss maintenance represents a major challenge in the management of obesity (Brownell, 1995; Stunkard, 1985). The vast majority of individuals who diet lose and regain weight many times, a pattern often referred to as weight cycling.

The present study was a prospective attempt to understand weight maintenance and fluctuation in a general/normal sample of individuals ($n = 315$) and in a select group of weight loss maintainers ($n = 19$). Participants were assessed twice, six months apart, and weight change over this period was correlated with several predictors assessed at Time 1. These predictors included weight-related demographics, laboratory stress-induced eating, dieting behaviors, depression, and general life stress. This study also examined factors associated with stress-induced eating in the laboratory and the relationship between depression and weight fluctuation.

Results from this study suggest that dietary factors and stress-induced eating are associated with weight fluctuations in men and women. Findings from this study

also suggest that proximity to ideal weight and social support for weight loss are related to continued weight loss among weight loss maintainers. In addition, these results indicate that increases in depression are associated with weight gain among weight cyclers but not among those without a weight cycling history. This finding occurred in both the general sample of participants as well as among the weight loss maintainers in this study.

This dissertation is dedicated to my parents, John and
Cindy Bishop. Words cannot express my gratitude.

CHAPTER I

INTRODUCTION

Obesity is one of the most prevalent public health problems in Western society. It is associated with a number of medical complications that lead to increased morbidity and mortality such as cardiovascular disease (CVD) (Hubert, Feinleib, McNamara, & Castelli, 1992), hypertension, hypercholesterolemia, non-insulin-dependent diabetes mellitus (National Institutes of Health Development Panel in Health Implications of Obesity, 1985), stroke, and certain types of cancer (Bray, 1985). In the U.S. alone, 26% of adults, or about 34 million people between the ages of 20 and 75 years, are obese (Van Itallie, 1985). Importantly, the prevalence of obesity has doubled since 1900 (Van Itallie, 1979), and public concern about obesity is reflected by the estimated \$55 billion spent annually in the United States for weight loss services and products (Marketdata Enterprises, 1989). Despite the substantial amount of money spent on weight loss efforts, research suggests that most individuals fail to maintain weight losses (Brownell, 1995; Stunkard, 1985). Instead, most

dieters lose and regain weight many times, a pattern often referred to as weight cycling (Brownell, Greenwood, Stellar, & Shrager, 1986).

The focus of the present study was not obesity per se, but rather the maintenance of weight in contrast to weight loss and weight gain. Specifically, the present study examined longitudinal predictors of weight fluctuation (i.e., loss or gain) in both a normal sample and a selected sample of individuals who had maintained a substantial weight loss for 6 to 18 months. The predictors examined included variables related to weight loss history, weight control factors such as exercise and dieting behaviors, and stress-induced eating behavior. Background literature and justification for the present study came from five main areas: research specifically focusing on obesity, research on more general issues related to maintaining, losing, or gaining weight, research on factors associated with maintaining a weight loss, weight cycling research, and research examining the relationship between stress and eating behavior.

Obesity

Obesity is a disorder of energy balance that occurs when energy input exceeds energy output resulting in a

surplus of adipose tissue in proportion to lean body mass (Bray, 1986). Weight is the most commonly used indirect assessment technique for estimating excess body fat, and the Metropolitan height/weight tables, based on statistics of life insurance policy holders, have served for years as the norm for defining obesity (Forey, 1987). The most frequently used criterion of obesity is 20% over ideal weight for height (Jeffrey & Knuss, 1981), a cutoff which is associated with significant increases in morbidity and mortality (Bray, 1986). However, this method for determining obesity does not accurately measure adiposity and thus is being used less frequently in research programs on obesity (Williamson et al., 1986). At present, several methods for estimating body fat exist, including measurement of skin-fold thickness to more expensive methods such as magnetic resonance (Bray, 1986). Use of body-mass index ($wt/(ht)^2$) has become a popular means of determining weight status and has been found to be highly correlated with adiposity, except in individuals with large amounts of muscle mass such as athletes and body builders (Forey, 1987).

Theories of Obesity

Some discussion of the current theories attempting to explain obesity seems warranted as they may also be beneficial in understanding weight maintenance, the occurrence of weight cycling (i.e., loss and regaining of weight), and stress-related eating as well.

Genetic Contributions to Obesity

Studies of Familial Resemblance. The familial occurrence of obesity has long been reported in the literature. Rony (1940) found that over two-thirds of 250 obese individuals had at least one obese parent, a finding which has been supported by a number of other investigators (e.g., Angel, 1939; Bauer, 1945; Gurney, 1936; Iverson, 1953). Familial resemblance in nutrient intake has also been reported between parents and their children. Bouchard (1997) investigated the potential role of heredity in macronutrient selection and energy intake in a group of 365 families in the Quebec Family Study. Significant familial resemblance was observed for both energy intake and macronutrient selection.

Body weight distribution (whether weight is primarily in the upper or lower body) has also been found to be similar among family members (Bouchard et al., 1990).

Twin Studies. Brook et al. (1975) measured subscapular and triceps skinfolds in a sample of 78 monozygotic and 144 same-sexed dizygotic pairs of twins and found a heretibility of .77 for the entire pooled sample. Borjeson (1976) found an even more substantial contribution for hereditability in a twin sample of 40 monozygotic and 61 same-sexed dizygotic twin pairs.

In another investigation, Stunkard, Foch, and Hrubec (1986) measured height, weight, and body-mass index in a sample of 1,974 monozygotic and 2,097 dizygotic twin pairs and reported that concordance rates for overweight were twice as high for monozygotic as for the dyzygotic twins. Their findings revealed a high heritability for height, weight, and body-mass index, both at the age of 20 and 45 years. In a more recent investigation, Stunkard et al. (1990) reported that genetic factors accounted for 66-70% of the variance in body mass index in 93 pairs of identical twins reared apart.

Adoption Studies. In an early study of obesity among adopted children, Withers (1964) reported significant correlations for weight and height among adopted children and their biological parents but not between adoptive parents and adopted children.

Mayer (1975) reported some informal observations of a sample of high school graduates in Massachusetts. Results revealed that only 14 percent of the children of normal weight parents were obese. When one parent was overweight, the percentage increased to 40 percent and then to 80 percent when both parents were overweight. Mayer (1975) noted no similar regularity in the incidence of obesity among adoptees, even though some had been adopted at birth.

Overall, findings from investigations of familial resemblance and twin and adoption studies suggest there is a heritable component to obesity, and this factor may account for as much as two-thirds to three-fourths of the variance in obesity measurements.

Physiological Influences on Obesity

The two most commonly discussed theories concerning the physiology of obesity are the fat cell theory and the set point theory (Brownell, 1984).

Fat Cell theory. The fat cell theory was developed by Hirsch and Knittle (1970) who reported that adult-onset obese persons had fat cells much larger (hypertrophy) than those of normal weight controls and that childhood-onset obese persons had an increased number of fat cells (hyperplasia). This theory holds that both hypertrophically

and hyperplastically obese persons are likely to be very heavy and find weight loss quite difficult because they have either acquired fat cells much larger than those of normal weight individuals or have accumulated a large number of fat cells for which there is a biological pressure to keep supplied with energy (Hirsch & Knittle, 1970).

According to Brunzell and Greenwood (1983), one possible link between fat cell morphology and obesity is lipoprotein lipase (LPL), an enzyme which is synthesized by the fat cell and is crucial to the uptake of fatty acid in adipose tissue. Previous research with both humans and animals (Gruen & Greenwood, 1982; Schwartz & Brunzell, 1981) indicates that adipose tissue LPL activity increases with weight loss, making the cell more efficient at accumulating energy.

In support of the fat cell theory, Bjorntorp et al. (1975) found that obese women tended to drop out of treatment and cease losing weight when fat cell size reached normal levels. It is possible that cell size represents a biological limit beyond which weight loss is exceedingly difficult and that fat cell number determines the body weight at which this limit is reached (Bjorntorp, 1975). It has been argued that the biological pressure for obese

persons to keep their adipose cells nourished may parallel the distress experienced by normal-weight persons undergoing starvation; they report persistent hunger, preoccupation with food, and a number of psychological symptoms (Keys et al., 1950). Importantly, this activity may vary among individuals and may be one predictor of who will regain weight once it is lost.

Set Point Theory. Several theorists (e.g., Cannon, 1939; Keys et al., 1950; Sims and Horton, 1968) have proposed a body weight "set point," or an ideal biological weight for an individual. According to the theory, the set point is maintained by the body's homeostatic mechanisms (Cannon, 1939). Support for the set point theory is shown by the relative weight stability of individuals and by evidence for mechanisms that actively resist changes in weight (Keeseey, 1995). Previous research has shown that if body weight is caused to decline from the normally-maintained level, adjustments in both food intake and metabolic rate occur which favor restoration of the lost weight (Keeseey, 1980; Keys et al., 1950; Sims & Horton, 1968). Similarly, physiological and behavioral adjustments are made to counteract increases in weight above the normally maintained level such that intake of food is

decreased and energy expenditure increased. The body may send out physiological and psychological signals to defend against changes above or below the set point (Keeseey, 1980; Keys et al., 1950; Sims and Horton, 1968). As such, the presence of an ideal biological weight in individuals may result in dieting attempts being met with great resistance.

Environmental Influences on Obesity

Externality Theory. Momentary environmental stimuli are believed to affect eating behavior and body weight (Rodin, 1980). In fact, past research has found that factors like time of day and the amount of food present play such an important role in determining eating behavior that short- and long- term biological regulation may be modified and/or overridden by such environmental variables (Rodin, 1980). It has been suggested that one major difference between individuals who are overweight and those who are normal weight is that heavy people frequently eat in response to immediate cues associated with food rather than internal physiological stimuli, or hunger (Rodin, 1980). For instance, the eating behavior of overweight individuals has been shown to be influenced more than that of normal weight people by manipulations of the passage of time (Rodin, 1975; Schacter & Rodin, 1974).

As can be seen from this review, several theories have been proposed to explain the development and maintenance of obesity. It is clear that a number of variables are important in determining body weight and that none of these factors taken alone can sufficiently explain the occurrence of a condition as complex as obesity.

General Influences on Weight

Dietary Factors Influencing Weight

Previous research has found that fat consumption is one of the most important factors involved in body weight (Schlundt et al., 1993; Shah et al., 1994), and the idea that high-fat diets promote obesity is widely accepted (Flatt et al., 1985; Lissner & Heitmann, 1995). Fat is known to have a different influence on body weight than food energy in the form of carbohydrates and protein. Apparently, the body cannot regulate the fat balance as accurately and effectively as it regulates protein and carbohydrate balances (Castellanos & Rolls, 1997). As such, efforts at limiting fat intake are vital to maintaining one's weight. In order for an individual to maintain a constant weight, his or her body must burn a mixture of fuels which is comprised of exactly the same mixture of proteins, carbohydrates, and fats which are consumed. If

this adjustment is not perfect, gains or losses of body fat will result (Kendall, Levitsky, Strupp, Lissner, 1991; Lissner, Levitsky, Strupp, Kalkwarf, & Roe, 1987).

Exercise and Weight Control

The finding that level of physical activity is inversely related to body mass index has frequently been reported throughout the literature (Brownell, 1995; Lee, Paffenbarger, & Hsieh, 1992; Romieu et al., 1988; Williamson et al., 1992). However, the exact relationship between exercise and weight control is unclear. It has been reported that exercise is related to weight control by (a) increasing lean body mass resulting in a higher metabolic rate; (b) increasing the metabolic rate during and following the exercise period; and (c) the energy expenditure of the activity itself (Brownell, 1995). Despite the support for these avenues by which exercise potentially can affect weight, some recent investigators have reported that exercise alone, without restrictions in dietary intake, has relatively little effect on body weight (Garrow, 1995; Phinney, 1992).

Social Influences on Weight

Culture, which can be defined as the system of categories, rules, and values that governs structures,

processes, and ideals in a society, is a powerful determinant of body weight because it sets the context for eating and activity and also assigns morals and social meanings to weight (Sobal, 1995). Individuals in non-industrialized cultures experience a significant risk of food insufficiency. As such, fatness is viewed as a sign of health and wealth although the luxury of becoming obese is rare. On the other hand, people in industrialized societies are offered ample amounts of a wide range of energy-dense foods, making weight gain easy and loss difficult. In these societies, slimness is regarded as the ideal while obesity is rejected and stigmatized (Sobal, 1995).

Other demographic variables such as gender and socioeconomic status (SES) have also been found to be related to weight (Dalton, 1997). For instance, women are judged more by their appearance than are men and this has been associated with greater concern about thinness among women (Kumanyika & Morssink, 1997). SES, which stratifies people by income, education, occupation, and family background also appears to influence and to be influenced by weight (Dalton, 1997). SES is thought to influence weight through the availability of resources, patterns of life style, and availability of knowledge while weight influences

SES through prejudice and discrimination against obese people, preventing their access to important social positions that ensure the social mobility necessary to attain higher SES (Dalton, 1997). Among women there is an inverse relationship between SES and weight with higher SES women being thinner than low SES women (Dalton, 1997). The relationship between SES and weight among men, however, is less clear.

Metabolic Influences on Weight

Resting Metabolic Rate (RMR) represents the average energy metabolism of a person resting in a comfortable environment not engaged in any physical activities (Dalton, 1997). Resting metabolism is responsible for a larger percentage of total energy expenditure than is physical activity (Bray, 1976; Garrow, 1974; Wooley, Wooley, & Dyrenforth, 1979); however, exercise and/or caloric restriction may exert more of an influence on body weight by increasing or decreasing metabolic rate.

Caloric restriction produces a 15 to 30 percent decrease in resting metabolic rate in both obese and lean persons (Apfelbaum, Bostsarron, & Lacatis, 1971; Bray, 1969; Buskirk, Thompson, & Lutwak, 1963), and Bray (1969) has shown that this decrease begins 24 to 48 hours after caloric

restriction begins and can exceed 20 percent in as little as 2 weeks. By the end of two months' caloric restriction, metabolic rate can decrease by 50% and beyond three months may stop almost completely (Bray, 1969). This slowing metabolic rate can prevent further weight reduction.

Garrow (1974) reported that with successive episodes of caloric restriction, metabolic rate falls more rapidly with each episode and the return to baseline levels takes longer each time the restriction ends. It is likely, therefore, that repeated attempts at weight reduction may lead to progressive slowing of weight loss and to more rapid regaining of weight (Garrow, 1979). In fact, Brownell et al. (1986) reported that a cycle of weight loss and regain made it more difficult for rats to lose weight on a second equally restricted diet. Consistent with these data, Blackburn et al. (1989) found obese patients lost weight more slowly the second time they received the same restricted diet.

Maintenance of Weight Loss

Maintenance of weight loss represents the most pressing challenge in the management of obesity (Brownell, 1995). According to Stunkard (1985), roughly two-thirds of individuals who lose weight will maintain the weight loss

over the next year but virtually all will regain the lost weight within 3 to 5 years.

Poor maintenance of weight loss stems from a complex interaction of physiological, environmental, and psychological variables (Perri, as cited in Brownell & Fairburn, 1995). Many of the factors which were discussed above as having important influences on weight in general are also important for the maintenance of a weight loss. However, other factors more specific to maintaining a weight loss also play a role and will now be discussed.

Diet and Weight Loss Maintenance

Recent research indicates that fat restriction is critical not only for weight reduction, but also for weight loss maintenance (Dalton, 1997). As previously discussed, empirical evidence suggests that the body is not energy blind (i.e, all energy nutrients do not contribute equally to energy balance) and there appear to be separate regulators of carbohydrate, protein, and fat metabolism. Astrup et al. (1996) propose that energy balance can only be achieved by macronutrient balance. In turn, achievement of macronutrient balance requires that net oxidation of each macronutrient equals the average amount of the same macronutrient in the diet. Overconsumption of fat, for

example, to the point that its ingestion exceeds the body's ability to oxidize it, could then lead to lipid storage, regardless of the total energy intake (Astrup et al., 1996).

Obese or formally obese individuals are believed to have an impaired capacity to oxidize dietary fat and, therefore, a tendency to store body fat when consuming a high fat diet. Providing support for this suggestion, Astrup and colleagues (1996) matched a sample of formerly obese women to never-obese controls and fed them diets of varying fat intake. Participants consumed diets consisting of 20% fat (low fat), 30% fat (medium fat), or 50% fat (high fat) for three days prior to and the day of a 24-hour respiratory chamber stay. After adjusting the 24-hour energy intake to equal output, Astrup et al. (1996) found that in all subjects consuming 20% to 30% fat diets there was no difference in macronutrient (carbohydrate and fat) oxidation. However, the formerly obese women who had consumed the 50% fat diet were unable to increase the ratio of fat to carbohydrate oxidation appropriately, resulting in a positive (+11 g/day) fat balance (Astrup et al., 1996). Findings from McGuire, Wing, Klem, Lang, and Hill's (1999) longitudinal investigation of successful weight loss maintainers further support the idea that dietary fat intake

is an important predictor of who will regain weight versus those who will continue to maintain weight loss. In this study, the authors found that individuals who regained weight reported a significant increase in daily energy obtained from fat while maintainers reported no change in daily fat consumption. Thus, it appears that high fat diets can lead to difficulty maintaining lost weight and this can be especially problematic for individuals with a history of obesity.

Exercise and Weight Loss Maintenance

Exercise is now believed to be vital to successful long-term weight control (Pronk & Wing, 1994). Almost universally, people who have been found to maintain large weight losses report that they regularly exercise (Colvin & Olson, 1983; Hartman, Stroud, Sweet, & Saxton, 1993; Jeffery et al., 1984; Kayman, Bruvold, & Stern, 1990). Exercise has been hypothesized to facilitate weight loss maintenance by burning calories and minimizing reductions in fat-free mass (Hill et al., 1989) and resting metabolic rate (Mole, Stern, Schulta, Bernauer, & Holcomb, 1989) that normally accompany weight loss. In their longitudinal study of predictors of weight maintenance, McGuire et al. (1999) provide additional support for the suggestion that exercise is associated with

maintenance of weight loss. They reported that while weight loss maintainers and relapsers showed a decline in energy expenditure through exercise over time, gainers reported significantly greater decreases in exercise behavior than those who continued to maintain their weight loss.

The relationship between exercise and weight loss maintenance could, however, be explained by findings that exercise is associated with other important weight maintenance factors such as greater dietary compliance (Racette, Schoeller, Kushner, & Neil, 1995) and decreased preference for saturated fat in the diet (Bryner, Toffle, Ulrich, & Yeater, 1997). In addition, exercise may improve mood and self-esteem which could facilitate adherence to weight control behaviors (Grilo, Brownell, & Stunkard, 1993).

Social Support and Weight Loss Maintenance

Social support also appears important for weight loss maintenance. Family members may play a role in the development and/or maintenance of obesity for some dieters and have been found to both aid as well as hinder a person's attempts to lose weight (Dalton, 1997). Findings from previous research indicate that cooperative partners can have a positive impact on outcome. For example, Brownell

(1978) found that including spouses in treatment improved weight losses slightly during treatment but improved the long-term results dramatically. By six-month follow-up, patients in this study who were treated with their spouses had lost 30 pounds while patients in two other standard behavioral conditions in which spouses were not included had lost only 19 and 15 pounds.

Peer support has also been investigated in relation to weight-loss maintenance. Perri et al. (1984) examined the effect of a program of peer support on weight-loss maintenance. At the end of treatment, patients in a "buddy group" continued to hold regular meetings in which they monitored each other's weight, praised those who were successful, and used problem-solving skills to assist persons having difficulty (Perri et al., 1984). By 21 months' follow-up, patients in the buddy group had maintained 10 lb of an original 13.5 lb loss. By contrast, patients receiving standard behavior therapy and six biweekly booster sessions maintained only .8 pounds of an original 12.4 lb loss.

Findings from other studies also suggest that developing peer support groups consisting of other obese individuals may be beneficial for maintenance of weight loss

(Hoerr, Kallen, & Kwantes, 1995; McIntosh, Shifflett, & Picou, 1989; Perri, 1995).

Early Weight Loss and Attainment of Goal Weight

Weight loss in the first few weeks of a reduction program has been consistently and significantly associated with weight loss at the end of dietary and behavioral treatments (Wadden & Letizin, 1992; Wilson, 1985). It has also been associated with better weight loss maintenance (Black, 1989; Rodin et al., 1988).

In one study, the attainment of goal weight also facilitated maintenance of weight loss (Wolfe, 1992). Wolfe (1992) suggested that individuals who achieve goal weight show greater weight-related self-efficacy and may be willing to work harder to maintain a weight with which they are happy than individuals who do not achieve their goal weight. Individuals who lose weight but fail to reach their goal weight may abandon weight loss efforts because they are not personally satisfying (Wolfe, 1992).

Weight Cycling

No consistent definition of weight cycling has emerged from work in the field. In animal studies, cycling is a categorical variable, and cycles have been defined by their length, magnitude or rate of weight loss, as well as other

factors (Brownell, 1995). In human studies, however, weight variability is generally defined as a continuous variable expressed as variability in weight across repeated measures (Brownell, 1995). Studies vary in what is considered a weight cycle with weight losses and regains ranging from 5 to 20 pounds (Brownell, 1995). Despite the difficulty in defining it, weight cycling appears to be more common than continued weight loss maintenance among individuals attempting to lose weight. Weight cycling has been hypothesized as having adverse effects on both the physical and psychological well-being of individuals.

Health Consequences of Weight Cycling

Studies investigating the relationship between weight cycling and health have typically shown strong associations between weight variability, morbidity, and mortality. For instance, Lissner et al. (1986) studied 3,130 subjects in the Framingham Heart Study measuring individuals' weights every two years for 14 years of the study. Both all-cause mortality and mortality and morbidity from coronary heart disease (CHD) were increased significantly in both men and women with high levels of weight variability (i.e., weight cycling).

Similar findings were obtained by Blair et al. (1988) using data from the Multiple Risk Factor Intervention Trial (MRFIT) study to examine weight variability and health over a period of 6 to 7 years in 10,594 men at high risk for CHD.

Increased weight variability in individuals was associated with 50% to 60% increases in mortality from all causes, CHD, and cardiovascular disease (CVD). In subjects who had undergone at least one complete weight cycle (defined as a weight loss and regain of 10 pounds), there was a 55% increase in all-cause mortality, compared with subjects with stable weights.

These results need to be interpreted with caution, however, as these investigations assessed weight variability, not weight loss produced specifically by dieting. Thus, it is uncertain whether weight change was produced by dieting or was associated with existing health problems. Strong correlations between self-reports of dieting and weight fluctuation have, however, been reported (Brownell, 1995).

Despite the high prevalence of weight regain following a weight loss, few studies examining the psychological effects of weight cycling exist. It is difficult to imagine that weight regain is not associated with adverse

psychological consequences, given its public nature and society's negative attributions about the causes of obesity (e.g., lack of willpower, weakness) (Sobal, 1995). However, findings from the existing literature have been mixed.

In support of the idea that negative psychological consequences may be associated with weight cycling, Wadden and Wingate (1995) found that obese individuals frequently feel guilty, ashamed, and inadequate as a result of regaining weight and report that they are criticized by family, coworkers, and even health care providers for their failure to maintain a weight loss. Foreyt et al. (1995) also found that self-described weight fluctuators compared with nonfluctuators scored significantly lower on a measure of general well-being and were less likely to report that they had good or excellent physical health. In another study, Wadden, Stunkard, and Liebschutz (1988) followed participants for three years after treatment with a very low calorie diet and reported that weight regain negatively affected participants' self esteem, self-confidence, general level of happiness, and satisfaction with their appearance.

In contrast to these findings, however, Bartlett, Wadden, and Vogt (1996) failed to find a significant correlation between weight cycling and psychological health

in their assessment of 130 obese individuals. Comparisons in this study were made between those with mild, moderate, and severe histories of weight cycling. Results from their study provided only limited support for the belief that repeated cycles of weight loss and regain are associated with negative psychosocial consequences as those with mild and moderate weight cycling histories failed to differ significantly from those with severe histories of weight cycling. As Bartlett, Wadden, and Vogt (1996) suggest, their failure to find a significant relationship between weight cycling and psychopathology may have been due to the fact that the mild cyclers had experienced at least one cycle of weight loss and regain and it is possible that having one cycle of loss and regain is enough to produce adverse experiences. Also, as the authors point out, participants in their study were assessed before starting an intensive weight loss program. As such, feelings of hopelessness, frustration, and ineffectiveness may have been mitigated by the positive expectations associated with enrolling in treatment. To this end, the authors suggest that prospective studies are needed that assess the psychological status of weight cyclers before, during, and

after weight regain and changes in these individuals should be compared with obese individuals who remain weight stable.

Stress-Induced Eating

One factor often thought to be associated with overeating and obesity is stress, and two models have been proposed to explain the relationship between stress and eating. As will be seen in the discussion of these models, the literature suggests that stress appears to be related to eating in some individuals (i.e., dieters) but not in others, and only minimal support has been found to suggest that stress-induced eating is a predictor of who is or may become obese. However, stress may be associated with weight gain and/or failure to maintain a long-term weight loss, and prospective studies measuring weight change are needed to determine the effect of stress on weight fluctuations.

The General Effect Model

The general effect model of stress and eating predicts that stress will increase eating in all exposed organisms (Greeno & Wing, 1994). Research testing this model has been directed toward finding physiological pathways to explain stress-induced eating and has primarily been conducted using animal subjects (Greeno & Wing, 1994). Such studies have examined the relationship between eating and stress

associated with laboratory pain induction (i.e., electric shock, tail pinch, aversive handling, cold water swim), and findings from these studies are frequently cited as evidence for a role of endogenous opiates in stress-induced eating (e.g., Morley & Levine, 1980; Morley et al. as cited in Greeno & Wing, 1994). The general effect model has received some empirical support (e.g., Antleman et al., 1975; Bellisle et al., 1990; Nemeroff et al., 1978). However, as Greeno and Wing (1994) point out, the scarcity of data demands such findings be viewed as preliminary. At any rate, greater research attention has focused on testing an individual differences model of stress and eating.

Individual Differences Model

The individual differences model of stress-induced eating suggests that individual differences in learning history, attitudes, or biology determine the effects of stress on eating. Research studies testing this model have mainly involved investigations comparing stress-induced eating in normal weight and obese individuals and in those who are controlling their eating (i.e., restrainers or dieters) and those who are not.

Interest in the effects of stress on eating in humans began as an attempt to illuminate the etiology of obesity,

and two different hypotheses concerning the role of stress in the etiology of obesity have been postulated.

Psychosomatic accounts suggest that obese individuals are unable to distinguish between hunger and anxiety, either because they learned to associate them at a young age (Kaplan & Kaplan, 1957) or because they never learned to distinguish between them (Bruch, 1961). However, the second theory, which was proposed by Schacter et al. (1968), suggests that labeling physiological cues such as gastric contractions as hunger is a learned phenomenon that normal weight people acquire while overweight people do not. While these hypotheses differ in their accounts of the etiology of obesity, both predict that obese and normal-weight individuals will respond differently to stress such that when stress is present obese subjects will eat more than normal weight subjects but when stress is not present, eating by obese and normal weight subjects will be more similar.

A number of studies have tested the theory that obese and normal-weight individuals respond differently to stress or that identifiable subgroups of obese individuals respond differently to stress. In these investigations, a variety of operationalizations of stress have been used. For

instance, four of the laboratory tests have used threat of shock as the stressor (Abramson & Wunderlich, 1972; McKenna, 1972; Pine, 1985, Reznick & Balch as cited in Greeno and Wing, 1994). In another investigation, a group of young women were stressed by having them try to impress a strange man (Ruderman, 1983) while another study induced stress in subjects by having them attempt to solve unsolvable puzzles (Baucom & Aiken, 1981). In yet another investigation, eating behavior in the laboratory was measured on the day of a college course examination and the day following the examination (Slowchower, Kaplan, & Mann, 1981).

Three studies (McKenna, 1972; Pine, 1985; Slochower et al., 1981) have supported the hypothesis that obese people eat more when stressed than when not stressed, at least in some conditions, while five studies have not supported this hypothesis. Three of the five studies not supporting the hypothesis found no effect for stress (Abramson & Wunderlich, 1972; Lowe & Fisher, 1983; Schacter et al., 1968) while two reported that stressed overweight subjects actually ate less than unstressed overweight subjects, at least in some conditions (Reznick & Balch, 1977; Ruderman, 1983). Finally, three studies have shown that only some stressed overweight participants eat more than unstressed

subjects (Baucom & Aiken, 1981; Schlundt et al., 1991; Van Strien et al., 1986).

This finding that only some obese individuals overeat when stressed suggests that obesity alone does not predict vulnerability to stress-induced eating but rather that obesity interacts with, or is even superseded by, other important variables (Greeno & Wing, 1994). One study (Baucom & Aiken, 1981) clearly suggests that dieting, not obesity, is the relevant predictor of stress-induced eating. Baucom and Aiken (1981) reported that stressed subjects who were dieting ate more than unstressed subjects who were dieting, regardless of weight category. However, for nondieting subjects the opposite pattern was found with stressed individuals eating less than unstressed nondieters. Because many obese people diet, the failure to control for this important variable could contribute to the pattern of contradictory findings in the literature (Greeno & Wing, 1994). It is also possible, however, that the artificial characteristics of the laboratory stress studies prevent them from revealing a relationship between obesity and stress-induced eating that might exist in everyday life. For example, most of the studies used stressors that were short-term and of low intensity. Participants were aware

that the length of time for which they may feel stressed was limited because they were participating in a study and that they could withdraw from study participation at any point. Real-life stressors typically are present for an unspecified amount of time and are often not under the control of the individual. Such analog stressors may also lack ecological validity because the type(s) of stressor(s) used may not actually cause stress in the individual. For instance, Heatherton et al. (1992) have suggested that stresses must be ego-threatening (i.e., threatening to the person's self-efficacy or self-esteem) to induce eating; however, this issue has been debated (Heatherton, Herman, & Polivy, 1992; Ruderman, 1983; Slochower et al., 1981). As such, it is important that laboratory stress-induced eating investigations assess the degree of stress perceived by participants. It also appears useful to examine participants' levels of general life stress in the context of a laboratory stressor. It is possible that the individual must be under a certain amount of life stress for stress-induced eating in the laboratory to occur.

Objectives of the Current Investigation

This study was a prospective attempt to understand weight maintenance and weight fluctuation. Participants

were assessed twice, six months apart, and weight change over this period was correlated with several predictors assessed at Time 1. The purpose of this study was: a) to examine predictors of weight fluctuation (i.e., gain or loss) in a large sample of college students, b) to examine predictors of weight fluctuation in a group of individuals who had successfully maintained a weight loss of 15% or more of their body weight for 6 to 18 months, c) to examine factors associated with stress-induced eating in the laboratory, and d) to examine the relationship between depression and weight fluctuation.

It was hypothesized that a history of weight cycling, fewer weight control strategies, greater reports of life stress, and greater amounts of food eaten during the laboratory stressor would be associated with weight fluctuations across the two assessments.

It was further anticipated that achievement of ideal or near ideal weight and more frequent weighing would be related to continued weight loss maintenance in the weight loss maintenance group. It was also expected that greater social support for losing weight would be associated with continued weight loss maintenance in the weight loss group.

Finally, it was expected that having a history of weight cycling, increased levels of dietary restriction, and greater levels of global life stress would be associated with greater stress-induced laboratory food consumption. It was further hypothesized that weight change across the 6-month assessment period would be associated with changes in depression across this same period in individuals with a history of weight cycling.

CHAPTER II

METHOD

Participants

Men and women ($n = 315$) were solicited via sign-up sheets from the population of undergraduates enrolled in psychology courses at the University of North Dakota during the 2000-2001 academic year. These students were part of the standard psychology subject pool in which research participation was a required or an elective assignment for various psychology courses. Such participants received course extra credit for participating in the study. In addition, undergraduates from other departments at UND were recruited via flyers which were displayed in various places across campus. Those individuals who were not eligible to receive course extra credit were offered cash payment (\$5.00) for their participation. Additionally, a selected group of women participants ($n = 19$) who had lost 15% or more of their body weight and had maintained this weight loss for 6-18 months were recruited from UND and the Grand Forks community (via advertisements on television and flyers placed in various locations in the community) for

participation in this study. Individuals in this group needed to provide a means by which the experimenter could verify that they had indeed lost a substantial amount of weight (i.e., a contact number of a friend or family member who could verify this, a note from their physician, or verification from a structured weight loss program such as Weight Watchers, Jenny Craig, etc.).

In terms of attrition in the general sample, 220 individuals, or 69.8% of the original ($n = 315$) sample, completed all measures as described in the protocol at both assessment periods while 69 participants, or 22% of the original sample, completed all measures at Time 1 but completed only the second weighing at Time 2 (i.e., did not complete the DIET or BDI-II). Furthermore, 5 of the individuals, or 1.5% of the original sample, completed the DIET and BDI-II and measured and recorded his or her weight at home and returned these reports via mail while 21 individuals, or 6.7% of the original sample, failed to complete any of the measures at the second assessment. Attrition did not occur within the sample of weight loss maintainers. All of these women ($n = 19$) completed measures at Time 1 and Time 2 in accordance with the protocol.

Materials

The Daily Hassles Scale

A revised version of the Daily Hassles Scale (DHS-R) was used in this investigation. The measure was initially developed by Kanner et al. (1981), but has since been revised by Holm and Holroyd (1992). The DHS-R is a 118-item instrument which assesses irritating, frustrating demands that occur during everyday transactions with the environment. The revised version (Holm & Holroyd, 1992) uses the following six-point scale to assess both the occurrence of and the severity of stress associated with each of the 118 hassles: 0 = "did not occur;" 1 = "occurred, not severe;" 2 = "occurred, somewhat severe;" 3 = "occurred, moderately severe;" 4 = "occurred, very severe;" 5 = "occurred, extremely severe." Factor analysis has revealed the presence of a hierarchical factor structure for the DHS-R. These analyses suggested there are seven primary factors and two secondary factors. The first secondary factor is Covert Hassles and is comprised of three of the primary factors: Inner Concerns ($\alpha = .83$ with factor loadings ranging from .31 to .58) which includes items such as regrets over past decisions, inability to express oneself, and being lonely; Time

Pressures ($\alpha = .81$ with factor loadings ranging from .30 to .75) which includes items like too many things to do, too many interruptions, and concerns about meeting high standards; Health Hassles ($\alpha = .64$ with factor loadings ranging from .34 to .71) which includes concerns about bodily functions and physical illness. The other secondary factor is Overt Hassles which is comprised of four primary factors. These include: Financial Concerns ($\alpha = .81$ with factor loadings ranging from .39 to .75) which includes items such as concerns about owing money, concerns about getting credit, and not having enough money for basic necessities; Work Hassles ($\alpha = .65$ with factor loadings ranging from .40 to .78) which includes items related to job dissatisfaction, problems with employees, and worries about decisions to change jobs; Environmental Hassles ($\alpha = .57$ with factor loadings ranging from .35 to .59) which includes concerns with crime, traffic, and pollution; Family Hassles ($\alpha = .59$ with factor loadings ranging from .31 to .50) which includes problems with children, home maintenance, and taxes.

Beck Depression Inventory—Second Edition (BDI-II)

The Beck Depression Inventory—Second Edition (BDI-II) (Beck, Steer, & Brown, 1996) is a standard 21-item device used for measuring the severity of depression in individuals aged 13 and older. Each item is rated on a 4-point scale (0-3) of intensity. Scores range from 0-63, with higher scores indicating greater severity of depression (Beck, Steer, & Brown, 1996). The BDI-II differs from the earlier versions (the BDI and BDI-A) on four items. The Weight Loss, Body Image Change, Somatic Preoccupation, and Work Difficulty items of the earlier versions were replaced with the Agitation, Worthlessness, Concentration Difficulty, and Loss of Energy items on the BDI-II in an effort to index symptoms which are commonly associated with severe depression (Beck, Steer, & Brown, 1996). The convergent validity of the BDI-II has been demonstrated by its high correlation with the BDI-IA (Beck, Rush, Shaw, & Emery, 1979) ($r = .84$), the Beck Hopelessness Scale (BHS; Beck & Steer, 1988) ($r = .68$), and the Hamilton Psychiatric Rating Scale for Depression (HRSD; Hamilton, 1960) ($r = .71$). The BDI-II has also been found to have high one-week test-retest reliability ($r = .93$) and good

internal consistency with a coefficient alpha of .93 (Beck, Steer, & Brown, 1996).

Current Measure of Mood Survey

The Current Measure of Mood Survey, a six-item Likert-type scale which was designed for use in this investigation, was used as a manipulation check for the laboratory stressor. Two of these items specifically assess the participant's subjective feelings of apprehension (Stressed/Relaxed and Nervous/Calm) while the remaining four questions are filler items.

Dimensional Coping Checklist

The Dimensional Coping Checklist (DCC), developed by Kaloupek (1987), is a 24-item checklist designed to assess how an individual has coped with a potentially stressful situation. This instrument consists of four dimensions: focus of the coping thoughts and behaviors; direction of the coping; the agency of coping; and the form of coping. The focus dimension reflects the extent to which an individual's coping behavior is focused on the environment or on his or her own abilities. Coping direction refers to whether the person's coping attempts are characteristically approach or avoidant in nature. The agency of the coping is whether an individual chooses to employ active or

passive coping techniques. The form of the coping is the extent to which an individual's coping is overt or covert in nature.

Dieter's Inventory of Eating Temptations (DIET)

The Dieter's Inventory of Eating Temptations (DIET), which was developed by Schlundt and Zimering (1988), is a situation-specific measure of weight control competence. The DIET consists of 30 eating or exercise problem situations that include a description of an effective solution. Participants are instructed to respond by rating the percentage of time they would behave in the manner described. The 30 items which comprise this measure assess 6 categories of behavior: overeating, resisting temptation, food choice, positive social eating, negative emotional eating, and exercise.

Items comprising the Overeating subscale include such things as percentage of time one would stop eating after having consumed more than one should and the percent of time one would snack on leftovers while putting away food from a meal one had just finished eating. Items on the Resisting Temptation subscale include such things as turning down second helpings when another person offers them and resisting the urge to stop for ice cream after

having a good day. The Food Choice subscale contains items such as rating the percentage of time one would choose having fruit rather than cake for dessert and percent of time one would choose a low calorie method of seasoning over butter or bacon fat. Items on the Positive Social Eating scale include percent of time the individual celebrates a special event with friends without overeating and percent of time the individual would refuse his or her friend's suggestion to stop for ice cream after having lunch with the friend. Furthermore, the Negative Emotional Eating scale includes such items as what percent of time the individual would find a more constructive means of coping after a stressful workday other than eating a candy bar or what percent of time the person would talk a problem over with another individual or go for a walk rather than eating. Finally, items on the Exercise subscale include the percent of time the person would chose to climb one or two flights of stairs rather than using the elevator and the percent of time the person would set aside a daily time for exercise.

Multiple regression analyses using meal pattern, caloric intake, and positive and negative emotional eating as predictors have accounted for between 16% and 54% of the

variance in DIET questionnaire scores (Schlundt & Zimering, 1988). Bivariate correlations between DIET scores and other measures have also supported the DIET's construct validity (Schlundt, 1995). For example, Tucker and Schlundt (1993) reported significant correlations between body mass index and all six DIET subscales. High one-week test-retest reliability correlations for the overeating (\underline{r} = .915), resisting temptation (\underline{r} = .908), food choice (\underline{r} = .809), positive social (\underline{r} = .814), negative emotional (\underline{r} = .920), and exercise (\underline{r} = .956) subscales have also been reported by Schlundt (1995).

Survey of Background Information and Weight History

The Survey of Background Information and Weight History was designed for use in this study and was used to obtain demographic information such as age, marital status, ethnic/racial background, and number of children. It also contains questions pertaining to weight history such as highest weight ever achieved, whether or not the individual has ever been overweight, age when he or she first became overweight (if currently overweight), number of times the individual has lost 5, 10, or 20 or more pounds and then gained it back, what the individual's weight has been over the last five years (i.e., has his/her weight been stable

or has he/she been gaining or losing weight), whether or not the person is currently at his or her ideal weight, what the individual considers his or her ideal weight to be, and whether or not the person has received positive social support for weight loss efforts.

Procedure

Individuals comprising the general sample ($n = 315$) were informed over the phone that they were being invited to participate in two research studies: the first would examine how individuals handle stress and prepare for a stressful situation and the second would look at health behaviors. Participants were informed that if they chose to participate they would also be contacted six months following their initial participation in these studies to complete another set of questionnaires about health behaviors. They were informed that participating in these studies (including the six-month follow-up) would take a total of 1-1 ½ hours of their time. Participants who were enrolled in psychology courses for which they could earn course extra credit were told that they would be awarded extra credit for their time while those not enrolled in such a course were informed that they would be paid \$15 for their participation (\$5 for each part of this study).

Upon arriving at the laboratory, each participant was greeted by an experimenter and seated. The experimenter reminded the participant that we were conducting two studies and gave the participant the first consent form (See Appendix A) while reminding him or her that the first study was interested in how individuals handle stress and prepare for a stressful situation. The experimenter informed the participant that the second study would be explained to him or her via a second consent form following completion of the first study.

It was then explained that we were interested in how well an individual could prepare to present one side of a controversial topic to another person in a limited amount of time. The experimenter then told the participant that "we want you to do as good a job as possible with your presentation, so it's important to us that you are as comfortable as you can be. Hence, we have provided a comfortable chair, good reading light, some water, and some candy for you as well." The experimenter provided the subject with a bowl separated into two equal compartments, containing Skittles® candies in one compartment and M & M® candies in the other.

Following completion of the first consent form, the participant was asked to complete the Daily Hassles Scale-Revised (DHS-R) (See Appendix B) and the Beck Depression Inventory-Second Edition (BDI-II) (See Appendix C). Upon completion of these questionnaires, the experimenter explained the task to the participant. The participant was informed that he or she would be choosing one side of the capital punishment issue (i.e., pro-capital punishment or anti-capital punishment) for purposes of preparing a three-minute presentation to another person. He or she was presented with a short list of information pertaining to both the pro-capital punishment and anti-capital punishment arguments (See Appendix D) and was given one minute to decide which side he or she would be advocating for during the presentation. After the minute had elapsed, the experimenter again entered the room and provided the subject with more detailed materials related to the side of the argument the participant had chosen for the presentation (See Appendix E). The participant was asked to deliver the presentation in a manner that would persuade another subject to adopt his or her view of the issue. Participants were told that they would be able to use this material for preparation, but it would be taken from them

just prior to their presentation. The participant was told that he or she would not know beforehand what the other participant's opinion actually was. The other participant was actually a confederate of the experimenter.

Confederates were of the same sex as the subject and were trained to respond to the subject in a structured, mildly negative manner (see below).

Once the participant understood what he or she was to do, the experimenter left the room for ten minutes to permit the participant to prepare the presentation. After this ten minutes had elapsed, the experimenter asked the participant to complete the Current Measure of Mood Survey (See Appendix F). After this was completed, the participant was escorted into the next room where the confederate was sitting. The participant was asked to have a seat in a chair adjacent to the confederate, and the experimenter introduced the two using first names. Next, the experimenter explained that the participant would be giving a three-minute presentation and that the confederate's job would be to listen to the participant. In the presence of the participant, the confederate was informed that he or she would not be allowed to argue with the participant's points but could indicate simple

agreement or disagreement. The experimenter then left the room for three minutes while the participant delivered his or her presentation. During this time, the confederate provided the participant with negative feedback. This negative feedback occurred at four, specific times during the presentation: following a point made by the subject 20-30 seconds into the talk, then again 50-60 seconds into the presentation, a third time at 110-120 seconds into the talk, and again at 140-150 seconds into the presentation (See Appendix G for examples of allowable negative verbal feedback).

During this time, the experimenter weighed the bowl of candy to determine the amount of candy eaten by the participant during preparation for the presentation. Following the three-minute presentation, the experimenter again entered the room and escorted the participant back to the room where he or she was originally sitting. The participant was asked to complete a second Current Measure of Mood Survey (in order to measure post-stressor feelings of apprehension) and the Dimensional Coping Checklist (See Appendix H) and was given ten minutes to do so. After the ten minutes had passed, the experimenter entered the room,

thanked the participant for participating in the first study and gave him or her extra credit or \$5.

The experimenter reminded the subject that the second study we were conducting was an investigation of health behaviors and asked if the subject would be willing to take part in this study as well. If the subject agreed to participate in the second study, he or she was given the second consent form (See Appendix I). Once this was completed, he or she was asked to complete the Survey of Background Information and Weight History (See Appendix J) and the Dieter's Inventory of Eating Temptations (DIET) (See Appendix K). Following completion of these questionnaires, the participant was brought into the next room, which contained a video camera. The participant was informed that he or she would weigh himself or herself using a strain-gauge digital scale. He or she was asked to remove shoes and anything in his or her pockets before weighing. The participant was informed that the video camera would be focused solely on the weight reading so that nothing more than the participant's feet would be seen. The participant was also informed that his or her subject number would be imprinted on the tape and that an experimenter later would record the number and weight so

that his or her name would in no way be associated with the data. Participants were instructed that they could step on the scale when the experimenter exited the room and that they could step off the scale when they heard a high-pitched tone. Participants were told that following the tone the experimenter would again enter the room. After participants' weights had been recorded, they were thanked for participating in this study and given extra credit or \$5 for their participation. Participants were also reminded that they would be contacted again in six months and asked to complete two additional questionnaires and be weighed again. Following each participant's departure, the bowl of candy was again weighed to determine the amount eaten after delivering the presentation.

Participants were contacted six months following their participation in this investigation. They were asked to return to the laboratory to fill out the DIET questionnaire and the BDI-II for the second time and to again be weighed. After completing this portion of the study, they were debriefed and given additional course extra credit or \$5.00 cash payment. During the debriefing, the objective of this investigation was revealed to participants (See Appendix L). At this time, the experimenter also asked participants

for their permission to combine the data from these two studies. They were provided with a permission form (See Appendix M) upon which they could indicate whether or not their data could be used. Participants consenting to have their data used were also asked if they would like to be informed of the results of this study. Participants wanting information pertaining to this study's results were asked to provide phone numbers or mailing addresses at which they could be reached in approximately six months.

The protocol was altered for the selected group ($n = 19$) of weight-loss maintainers. These individuals were informed over the phone that we were interested in weight, exercise, and dieting behaviors. Like the larger group of participants, they were informed that if they participated in this study they would be contacted again in six months to see if they would be willing to complete two additional questionnaires and again be weighed. They were informed that their participation would require a total of one hour of their time and that they would receive course extra-credit (if eligible) or \$5.00 for their participation in this study and additional extra credit or an additional \$5.00 should they complete the six-month post-assessment.

Upon arrival at the laboratory, the participant was greeted by an experimenter and presented with a consent form (See Appendix I). She was again told that we were interested in weight, exercise, and dieting behaviors. Upon completion of the consent form, she was asked to complete the Survey of Background Information and Weight History, the BDI-II, and the DIET. Upon completion of these questionnaires, the participant was asked to remove her shoes and items from pockets prior to weighing. As in the other sample, the participant was informed that the video camera would be focused on the weight reading as it appears on the face of the scale so that it would be impossible for her to be identified from this recording. Additionally, she was informed that the weight recording would be associated with her subject number only, and that an experimenter later would record her weight and subject number so that her name would in no way be associated with this data. The participant was instructed to step on the scale when the experimenter left the room and to step off the scale when she heard a beep. The participant was told that following the beep the experimenter would again enter the room.

As with the other group, these participants were contacted six months later and asked to come to the laboratory to complete two additional questionnaires (the BDI-II and DIET questionnaire for the second time) and to again be weighed. When the participant arrived for the six-month post-assessment, she was asked to complete the BDI-II and the DIET. Following completion of these questionnaires, she was asked to remove shoes and items from pockets and to again weigh herself in the same manner as in the initial weighing. Once the participant's weight had been recorded, she was debriefed, given extra credit or \$5.00 cash, and thanked for participating in this study. During the debriefing, the objective of this investigation was explained to the participant. If the participant wanted to know this study's results, she was asked to provide a phone number or mailing address at which she could be reached in approximately six months.

Statistical Analysis

A simultaneous multiple regression analysis was conducted to examine the utility of history of weight cycling, weight control strategies (DIET subscale scores), general life stress (Hassles total score), amount of candy consumed during the laboratory stressor, and BDI-II scores

at the first assessment as predictors of weight change at the second assessment (six months later) in the general ($n = 315$) sample.

A second simultaneous multiple regression analysis was conducted in the select ($n = 19$) group of weight loss maintainers. In this analysis, proximity to ideal weight, frequency of weighing, and social support for weight loss were used as predictors of weight change from the initial assessment to the six-month follow-up.

Another multiple regression analysis (predictors entered simultaneously) was conducted to examine the utility of history of weight cycling, dietary control, and global life stress as predictors of the amount of candy eaten in association with the laboratory stressor.

Several simple correlational analyses were also conducted to examine the relationship between weight change, stress-induced eating, general life stress, depression, dieting behavior, and weight-related demographic information among the normal/general sample of participants and in the weight-loss sample.

CHAPTER III

RESULTS

Analyses with the Normal/General Sample

Demographic Characteristics

There were 119 men and 196 women in the normal sample. The men averaged 20 years of age ($SD = 2.78$), and were mostly (91.4%) Caucasian (5.1% were Native American, 2.6% were Hispanic, and .9% were African American). The majority of men (88.2%) also reported being single and not cohabiting (7.2% were single but currently cohabiting with a partner, 2.5% were currently married, and 2% were divorced), and almost all of the men (95.8%) reported having no children. The average weight among these men was 186 pounds ($SD = 37.4$) at the first assessment and 185 pounds ($SD = 29.36$) at the second assessment. A substantial percentage of men considered themselves overweight (42.8%) with most of them reporting they were first overweight as a child (88.3%). Similarly, only 29.4% of men believed their current weight fell within 10 pounds of their ideal weight. Finally, 46.2% of the men reported that neither of their parents were overweight, while 17.6%

reported that their father was overweight, 20.2% reported their mother being overweight, and 16% reported both parents being overweight. Data regarding weight fluctuations or a weight cycling pattern can be found in Table 1.

The women in this normal sample averaged 19 years of age ($SD = 2.78$) and were mostly (96.1%) Caucasian (2% were Native American, 1.2% were Hispanic, and .7% were African American). The majority of women (86.2%) also reported being single and not cohabiting (8.2% were single but currently cohabiting with a partner, 4.5% were currently married, and 1% were divorced), and virtually all of the women (98.8%) reported having no children. The average weight among these women was 148 pounds ($SD = 38.48$) at the first assessment and 146 pounds ($SD = 29.32$) at the second assessment. A sizable percentage of these women considered themselves overweight (30.1%) with most of them reporting they were first overweight as a child (78.1%). Similarly, only 26% of women believed their current weight fell within 10 pounds of their ideal weight. Finally, 46.9% of the women reported that neither of their parents were overweight, while 14.8% reported that their father was overweight, 21.9% reported their mother being overweight

and, 16.3% reported both parents being overweight. Data regarding weight fluctuations or a weight cycling pattern for the women can also be found in Table 1.

Table 1

Weight-related Demographic Information for the Normal Sample

	<u>Men</u> (<u>n</u> = 119)	<u>Women</u> (<u>n</u> = 196)
<u>History of Weight Cycling</u> ⁴		
5 lbs.	78.2%	81.1%
10 lbs.	47.9%	39.8%
20 lbs.	21.0%	13.26%
<u>Number of +/-10 lb. Weight Fluctuations</u> ⁵		
0	37.0%	53.6%
1	26.1%	26.5%
2	18.5%	12.2%
3	11.8%	5.1%
4	6.7%	2.6%
<u>5-Year Weight Pattern</u> ⁶		
Weight Stable	15.1%	18.9%
Weight Gainer	68.9%	66.3%
Weight Loser	5.9%	6.6%
Weight Cyclers	10.1%	8.2%

Table 1 Cont.

⁴History of Weight Cycling. Defined as an individual having lost and regained each amount (5, 10, and 20 lbs.) at least once.

⁵Number of +/- 10 lb. Weight Fluctuations. Weight reports for adjacent years from January 1996-January 2000 were examined. If a weight change of +/-10 lbs. had occurred between the first two adjacent years (i.e., 1996 & 1997), it was counted as a "1." The next two adjacent years were similarly examined and counted. After examination of all adjacent years, the number of weight changes for each subject were summed.

⁶5-Year Weight Pattern. Weight reports were examined from January 1996-January 2000. Subjects whose weight had not fluctuated +/- 10 lbs. across the 5-year period were defined as Weight Stable. Those who had gained 10 lbs. or more during the 5-year period without returning to baseline were defined as Weight Gainers. Subjects losing 10 lbs. or more without returning to baseline were defined as Weight Losers. Subjects who gained or lost 10 lbs. or more and returned to baseline at least once during this period were defined as Weight Cyclers. Baseline weight was defined as \leq 10 lbs. of the participant's maximum Weight during this 5-year period (for weight losses) and \geq 10 lbs. of his or her lowest weight (for weight gains).

Predicting Weight Change

Gender, a history of weight cycling¹, DIET subscale scores, the Hassles total score, the amount of candy consumed during the laboratory stressor, and BDI-II scores at the first assessment were used as prospective predictors of weight change during the six-month period ($n = 294$).

¹ History of Weight cycling = number of times subject lost and regained 5, 10, and 20 lbs.

This simultaneous regression analysis yielded a statistically significant model [$F(13, 263) = 2.284, p < .01$, and $R^2 = .101$]. Examination of individual predictors revealed that two of the DIET subscales accounted for a significant amount of the variance: Negative Emotional Eating [Beta = .162, Part Correlation = .110, Zero-order Correlation = -.014] and Resisting Temptation [Beta = -.314, Part Correlation = -.154, Zero-order Correlation = -.108]. Amount of candy eaten in the laboratory was also found to be a significant individual predictor [Beta = .259, Part Correlation = .251, Zero-order Correlation = .263].

Discriminating Weight Gain, Weight Loss, and Weight Stable Participants

A Discriminant Analysis (using the direct entry method) was conducted to examine what differentiated weight loss ($n = 102$), weight gain ($n = 43$), and weight stable ($n = 132$) individuals². The same variables that were used as predictors in the above multiple regression were used as predictors in this analysis.

² Weight Stable = wt. deviation within ± 3 lbs. of wt time 1; Weight Loss = wt. decrease of > 3 lbs. from wt time 1; Weight Gain = wt. increase of > 3 lbs. from wt. time 1

The dimension reduction analysis showed that before any of the functions were derived there was a statistically significant amount of between-group variance [Wilks' Lambda = .792, Chi-square = 62.374, df = 26, $p < .01$]. After the first function was derived, however, there was not a statistically significant amount of between-group variance remaining [Wilks' Lambda = .933, Chi-square = 18.689, df = 12, $p = .096$]. Therefore, only one function was extracted and examined. This function had an eigenvalue of .177 and a canonical correlation of .388, indicating that it accounted for 15% of the total variance. The standardized canonical discriminant function coefficients for each predictor and the correlations between each predictor and the function can be found in Table 2. The group centroids for the two functions can be found in Table 3. Classification analyses revealed that overall 50.5% of individuals were correctly predicted to be in their actual group. The specific percentages for each group can be found in Table 4. Cross-validation classification analyses, as expected, revealed some shrinkage with 44.4% of the cases correctly classified. Results for specific groups can be found in Table 5.

Table 2

Standardized Canonical Discriminant Function Coefficients

	<u>Function 1</u>
Gender	.030
<u>History of Weight Cycling⁴</u>	
5 lbs.	.184
10 lbs.	-.192
20 lbs.	-.020
BDI-II (Time 1)	.448
Amount of Candy Consumed	.825
<u>DIET Subscales</u>	
<u>Time 1 (Mean)</u>	
Overeating	.671
Resisting Temptation	-.543
Food Choice	-.081
Positive Social Eating	-.386
Negative Emotional Eating	.435
Exercise	-.050
Hassles Total Score	-.249

Correlations Between Each Predictor and Function 1

	<u>Function 1</u>
Gender	.044

Table 2 Cont.

History of Weight Cycling⁴

5 lbs.	.113
10 lbs.	-.050
20 lbs.	-.041
BDI-II (Time 1)	.347
Amount of Candy Consumed	.784

DIET SubscalesTime 1 (Mean)

Overeating	.028
Resisting Temptation	-.185
Food Choice	-.108
Positive Social Eating	-.180
Negative Emotional Eating	.003
Exercise	-.010
Hassles Total Score	.131

⁴History of Weight Cycling. Defined as an individual having lost and regained each amount (5, 10, and 20 lbs.) at least once

Table 3

Group Centroids for Function 1

<u>Weight Status</u>	<u>Function 1</u>
----------------------	-------------------

Table 3 Cont.

Weight Losers (<u>n</u> = 102)	- .232
Weight Stable (<u>n</u> = 132)	- .137
Weight Gainers (<u>n</u> = 43)	.971

Table 4

Classification Results

	<u>Weight Loss</u> (n = 102)	<u>Weight Stable</u> (n = 132)	<u>Weight Gain</u> (<u>n</u> = 43)
Weight Losers	48.0%	36.3%	15.7%
Weight Stable	35.6%	47.0%	17.4%
Weight Gainers	11.6%	20.9%	67.4%

Table 5

Cross-validation Classification Results

	<u>Weight Loss</u> (<u>n</u> = 102)	<u>Weight Stable</u> (n = 132)	<u>Weight Gain</u> (<u>n</u> = 43)
Weight Losers	43.1%	40.2%	16.7%
Weight Stable	38.6%	40.2%	21.2%
Weight Gainers	14.0%	25.6%	60.5%

Discriminating Weight Cyclers and Non-Weight Cyclers

A Discriminant Analysis (using the direct entry method) was conducted to examine what differentiated individuals with a history of weight cycling³ ($n = 50$) from those without a history of weight cycling ($n = 257$). The variables which were used as predictors in this analysis included Gender, the Hassles total score, DIET subscale scores, amount of candy consumed in the laboratory, and BDI-II scores at the first assessment.

The only function derived accounted for a statistically significant amount of between-group variance [Wilks' Lambda = .927, Chi-square = 22.775, $df = 10$, $p < .05$]. It had an eigenvalue of .079 and a canonical correlation of .270, indicating that it explained 7% of the total variance.

The standardized canonical discriminant function coefficients for each predictor and the correlations between each predictor and the function can be found in Table 6. The group centroids for the function can be found in Table 7. Classification analyses revealed that overall 66.8% of individuals were correctly classified. The

³ History of Weight Cycling = losing and regaining 20 lbs. at least once.

specific percentages for each group can be found in Table 8. Cross-validation classification analyses, as expected, revealed some shrinkage with 62.9% of the cases correctly classified. Results for specific groups can be found in Table 9.

Table 6

Standardized Canonical Discriminant Function Coefficients

	<u>Function 1</u>
Gender	-.452
BDI-I (Time 1)	.605
Amount of Candy Consumed	-.197
<u>DIET Subscales</u>	
<u>Time 1 (Mean)</u>	
Overeating	-.502
Resisting Temptation	.500
Food Choice	.371
Positive Social Eating	.023
Negative Emotional Eating	-.337
Exercise	.328
Hassles Total Score	.348

Correlations Between Each Predictor and Function 1

Function 1

	<u>Function 1</u>
Table 6 Cont.	
Gender	-.366
BDI-II (Time 1)	.665
Amount of Candy Consumed	-.003
<u>DIET Subscales</u>	
<u>Time 1 (Mean)</u>	
Overeating	-.119
Resisting Temptation	.093
Food Choice	.190
Positive Social Eating	.086
Negative Emotional Eating	-.110
Exercise	.045
Hassles Total Score	.578

Table 7

Group Centroids for Function 1

	<u>Function 1</u>
<u>Weight Status</u>	
Weight Cyclers (\underline{n} = 50)	.635
Non-Weight Cyclers (\underline{n} = 257)	-.123

Table 8

Classification Results

	<u>Weight Cycling</u> (<u>n</u> = 50)	<u>Non-Weight Cycling</u> (<u>n</u> = 257)
Weight Cyclers	60.0%	40.0%
Non-Weight Cyclers	31.9%	68.1%

Table 9

Cross-validation Classification Results

	<u>Weight Cycling</u> (<u>n</u> = 50)	<u>Non-Weight Cycling</u> (<u>n</u> = 257)
Weight Cyclers	46.0%	54.0%
Non-Weight Cyclers	33.9%	66.1%

Predicting Laboratory Stress-Induced Eating

Gender, a history of weight cycling¹, general life stress (Hassles total score), and weight control strategies (DIET subscale scores) were used in a simultaneous multiple regression as cross-sectional predictors of candy eaten during the laboratory stressor (N = 315). This analysis

¹ History of Weight cycling = number of times subject lost and regained 5, 10, and 20 lbs.

did not yield a statistically significant overall model [$F(11, 291) = 1.263, p = .071, \text{ and } R^2 = .061$].

Laboratory Manipulation Check

A paired samples t -test was performed to determine if subjects ($N = 315$) reported higher stress ratings while preparing to deliver their speech than following the event. Results indicated there was a significant pre-post difference in stress ratings for both pairs of items assessing subjects' subjective feelings of apprehension: Relaxed/Stressed [$t(1, 308) = 21.868, p < .01$] and Calm/Nervous [$t(1, 308) = 23.009, p < .01$]. Table 10 provides the means and standard deviations for these two items at the pre- and post-assessments.

Table 10

Pre- and Post-Speech Mood Measure Scores for
Relaxed/Stressed and Calm/Nervous Items

($N = 315$)

	<u>Pre-Speech</u>		<u>Post-Speech</u>	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Relaxed/Stressed	5.73	(1.92)	3.31	(1.75)
Calm/Nervous	5.93	(1.72)	3.32	(1.72)

Bivariate Correlations with Weight Change and Stress-Eating

Exploratory bivariate correlational analyses were conducted to examine the relationship between weight change across the 6-month period, laboratory stress-induced eating, weight-related demographic information, DHS subscale scores, DIET subscale scores (Time 2), BDI-II scores at the first and second assessment, and laboratory coping (DCC subscale scores) (see Table 11).

Table 11

Correlations of Weight Change and Amount of Candy Eaten in Lab with Weight-related Demographics, Hassles, Dieting Behavior, Depression, And Laboratory Coping

	<u>6-mt Weight Change^a</u>	<u>Amount of Candy Eaten in Lab</u>
History of Being Overweight ⁷	-.140**	-.098
Parents Overwt. ⁸	-.047	.014
Frequency of Weighing	-.107	-.001
Difference btwn. Actual Wt. and Ideal Wt. ⁹	.191**	-.061
<u>Hassles Subscales (Sum)</u>		
Inner Concerns	.066	.142**
Time Pressures	.003	.150**
Health Concerns	.009	.095
Financial Concerns	.032	.038

Table 11 Cont.

Hassles Subscales (Sum)

Work Concerns	.047	.054
Environ. Concerns	-.040	.056
Family Concerns	.040	.158**

DIET SubscalesTime 2 (Mean)^b

Overeating	-.157**	-.065
Res. Temp.	-.177**	-.089
Food Choice	-.092	-.079
Pos. Soc. Eating	-.132	-.007
Neg. Emot. Eating	-.175**	-.120
Exercise	-.066	-.013
BDI (Time 1)	.077	.143**
BDI (Time 2) ^b	.086	.138**

Dimensional Coping Checklist
(Mean)

Focus	-.081	.160**
Production	.077	-.114**
Direction	.068	-.073

(*; $p < .05$; **; $p < .01$)Note-Unless otherwise specified, analyses are based on $N = 315$.^a $n = 289$ ^b $n = 225$ ⁷ History of Being Overweight = Subject reporting he or she has been overweight at some point.

Table 11 Cont.

⁸ Parents Overweight = Subject reporting at least one parent being overweight.

⁹ Difference btwn. Actual Wt. and Ideal Wt. = Ideal Weight - Actual Weight (Time 1).

Bivariate Correlations between Weight Change and Depression among Weight Cyclers and Non-Weight Cyclers

Bivariate correlational analyses were used to examine the relationship between weight fluctuation and depression among those with a history of weight cycling (i.e., had lost and regained 20 lbs. at least once) ($n = 34$) and those without such a history ($n = 180$). Reports of these correlations for the two groups can be found in Table 12.

Table 12

Correlations of 6-mt Weight Change and Depression Scores in Weight Cyclers and Non-Weight Cyclers

	<u>Weight Cyclers</u> ($n = 34$)	<u>Non-Weight Cyclers</u> ($n = 180$)
	<u>6-mt Weight Change</u>	<u>6-mt Weight Change</u>
BDI-II (Time 1)	.389**	-.017
BDI-II (Time 2)	.501**	-.037

(*; $p < .05$; **; $p < .01$)

Bivariate Correlations with General Life Stress

Exploratory bivariate correlational analyses were conducted to examine the relationship between global life stress (DHS subscale scores) with weight-related demographic information, DIET subscale scores (Time 1), and BDI-II scores at the first assessment ($N = 315$) (see Table 13).

Table 13

Correlations of General Life Stress with Weight-related Demographics, Dieting Behavior, and Depression

($N = 315$)

	<u>Hassles Scale (Sum)</u>						
	<u>IC</u>	<u>TP</u>	<u>HE</u>	<u>FI</u>	<u>WC</u>	<u>EN</u>	<u>FA</u>
History of Being Overweight ⁷	-.042	-.031	-.052	-.037	-.040	-.036	-.044
Parents Overwt. ⁸	.023	.003	.023	.041	.056	.069	.061
Frequency of Weighing	.057	.070	-.015	-.067	-.066	-.053	.022
Difference btwn. Actual Wt. and Ideal Wt. ⁹	-.068	-.067	-.088	-.138*	-.088	-.066	-.029
<u>Number of Times Lost and Regained X lbs.</u>							
5 lbs.	.191*	.041	.114*	.134*	.112*	.057	.108
10 lbs.	.098	.034	.021	.011	.035	-.003	.032
20 lbs.	.133*	.126*	.087	.030	.143*	.133*	.174
<u>DIET Subscales</u>							
<u>Time 1 (Mean)</u>							

Table 13 Cont.

Overeating	-.125*	-.062	-.043	-.021	-.104	-.080	-.123*
Res. Temp.	-.152	-.109	-.034	-.083	-.102	-.074	-.067
Food Choice	-.086	-.020	-.070	-.048	-.098	-.057	-.070
Pos. Soc. Eating	-.099	-.033	-.017	-.071	-.057	-.079	-.039
Neg. Emot. Eating	-.220	-.125*	-.103	-.140*	-.145*	-.096	-.131*
Exercise	-.210*	-.132*	-.192*	-.163*	-.132*	-.289	-.187
BDI-II (Time 1)	.637**	.446**	.429**	.381**	.265**	.252	.306

(*; $p < .05$; **; $p < .01$)

⁷ History of Being Overweight = Subject reporting he or she has been overweight at some point.

⁸ Parents Overweight = Subject reporting at least one parent being overweight.

⁹ Difference btwn. Actual Wt. and Ideal Wt. = Ideal Weight - Actual Weight (Time 1).

Analyses with the Sample of Weight Loss Maintainers

Demographics Characteristics

There were 19 women comprising the weight-loss sample. The women in this sample averaged 28 years of age ($SD = 8.68$) and were mostly (90.7%) Caucasian (5.5% were Native American, 2.5% were Hispanic, and 1.3% were African American). The majority of the weight-loss women (57.9%) also reported being single and not cohabiting (21.2% were single but currently cohabiting with a partner, 21.1% were currently married, and 1.0% were divorced), and most of the women (73.7%) reported having no children. These women had lost 35.76 pounds ($SD = 8.70$), on average, prior to their

participation in this study and had lost a total of 38.95 pounds ($SD = 12.90$), on average, by the six-month follow-up assessment. The average weight among these women was 176 pounds ($SD = 40.46$) at the first-assessment and 173 pounds ($SD = 29.32$) at the second assessment. The majority of these women (84.2%) reported receiving social support for their weight loss efforts. All of these women (100%) considered themselves overweight with 57.9% of them reporting they were first overweight as a child. Similarly, only 26.3% of these women believed their current weight fell within 10 pounds of their ideal weight. Finally, 21.1% of the women in this sample reported that neither of their parents were overweight, while 26.3% reported that their father was overweight, 42.1% reported their mother being overweight, and 10.5% reported both parents being overweight. Data regarding weight fluctuations or a weight cycling pattern for the weight loss sample can be found in Table 14.

Table 14

Weight-related Demographic Information for Weight Loss Sample

Women
($N = 19$)

Table 14 Cont.

History of Weight Cycling⁴

5 lbs.	94.7%
10 lbs.	84.2%
20 lbs.	57.9%

Number of +/-10 lb. Weight Fluctuations⁵

0	15.8%
1	15.8%
2	26.3%
3	31.6%
4	10.5%

5-Year Weight Pattern⁶

Weight Stable	0.0%
Weight Gainer	47.4%
Weight Loser	10.5%
Weight Cyclers	42.1%

(*; p<.05; **; p<.01)

⁴History of Weight Cycling. Defined as an individual having lost and regained each amount (5, 10, and 20 lbs.) at least once.

⁵Number of +/- 10 lb. Weight Fluctuations. Weight reports for adjacent years from January 1996-January 2000 were examined. If a weight change of +/-10 lbs. had occurred between the first two adjacent years (i.e., 1996 & 1997), it was counted as a "1." The next two adjacent years were similarly examined and counted. After examination of all adjacent years, the number of weight changes for each subject were summed.

Table 14 Cont.

5-Year Weight Pattern. Weight reports were examined from January 1996-January 2000. Subjects whose weight had not fluctuated ± 10 lbs. across the 5-year period were defined as Weight Stable. Those who had gained 10 lbs. or more during the 5-year period without returning to baseline were defined as Weight Gainers. Subjects losing 10 lbs. or more without returning to baseline were defined as Weight Losers. Subjects who gained or lost 10 lbs. or more and returned to baseline at least once during this period were defined as Weight Cyclers. Baseline weight was defined as ≤ 10 lbs. of the participant's maximum weight during this 5-year period (for weight gains) and > 10 lbs. of his or her lowest weight (for weight losses).

Predicting Weight Change

A simultaneous multiple regression analysis was conducted to determine the utility of frequency of weighing, social support, and difference between actual and ideal weight as predictors of weight change over the six-month assessment period in the sample of weight loss maintainers ($N = 19$). This analysis yielded a statistically significant overall model [$F(3, 15) = 4.203$, $p < .05$, and $R^2 = .457$]; however, none of the individual predictors were found to be statistically significant.

Bivariate Correlations with Weight Change

Exploratory bivariate correlational analyses were conducted in the sample of weight loss maintainers to examine the relationship between weight fluctuation across

the 6-month period and weight-related demographic information, DIET subscale scores (Time 1), and BDI-II scores at the first and second assessment ($N = 19$). See Table 15 for a report of these correlations.

Table 15

Correlations of Weight Change with Weight-related Demographics, Dieting Behavior, and Depression in Weight-loss Maintainers

	($N = 19$)
	<u>6-mt Weight Change</u>
History of Being Overweight ⁷	a
Parents Overwt ⁸	-.043
Frequency of Weighing	-.177
Distance btwn. Actual Wt. And Ideal Wt. ⁹	-.512*
Soc. Support for Wt. Loss	-.527*
<u>Number of Times Lost And Regained X lbs.</u>	
5 lbs.	-.377
10 lbs.	-.542*
20 lbs.	.047
<u>DIET Subscales</u>	
<u>Time 1 (Mean)</u>	
Overeating	.118

Table 15 Cont.

Resis. Temp.	-.217
Food Choice	.090
Pos. Soc. Eating	-.228
Neg. Emot. Eating	-.130
Exercise	-.357
BDI-II (Time 1)	.164
BDI-II (Time 2)	.187

p<.05; **; P<.01)

⁷ History of Being Overweight = Subject reporting he or she has been overweight at some point.

⁸ Parents Overweight = Subject reporting at least one parent being overweight.

⁹ Difference btwn. Actual Wt. and Ideal Wt. = Ideal Weight - Actual Weight (Time 1).

^a correlation could not be computed because all weight loss participants reported being overweight.

Bivariate Correlations between Weight Change and Depression among Weight Cyclers and Non-Weight Cyclers

Bivariate correlational analyses were used to determine the relationship between weight fluctuation and depression among those with history of weight cycling ($n = 11$) (i.e., had lost and regained 20 lbs. at least once) and those without such a history ($n = 8$). Reports of these correlations for the two groups can be found in Table 16.

Table 16

Correlations of 6-mt Weight Change and Depression Scores in Weight Cyclers and Non-Weight Cyclers in Weight-Loss Maintainers

	<u>Weight Cyclers</u> (<u>n</u> = 11)	<u>Non-Weight Cyclers</u> (<u>n</u> = 8)
	<u>6-mt Weight Change</u>	<u>6-mt Weight Change</u>
BDI (Time 1)	.218	-.708*
BDI (Time 2)	.779**	-.625

(*; P<.05; **; p<.01)

Bivariate Correlations with Weight-related Demographics

Bivariate correlational analyses were also conducted to examine the relationship between weight-related demographics, DIET subscale scores (Time 1), and BDI-II scores at the first and second assessment in the sample of weight-loss maintainers (N = 19). Table 17 lists these correlations.

Table 17

Correlations of Weight-related Demographics with Dieting Behavior, and Depression in Weight-loss Maintainers

(N = 19)

<u>Hist.</u> <u>Overwt.</u>	<u>Par.</u> <u>Overwt.</u>	<u>Freq.</u> <u>Weigh.</u>	<u>Diff.</u> <u>Actual/</u> <u>Ideal</u>	<u>Soc.</u> <u>Support</u> <u>for Wt.</u> <u>Loss</u>
--------------------------------	-------------------------------	-------------------------------	--	--

Table 17 Cont.

History of Being Overweight ¹	-----	a	a	a	a
Parents Overweight ²	a	-----	-.124	-.429	-.114
Frequency of Weighing	a	-.124	-----	.409	.069
Difference btwn. Actual Wt. And Ideal Wt. ³	a	-.429	-.429	-----	-.226
Soc. Support for Wt. Loss	a	-.114	.069	-.226	-----
<u>Number of Times Lost And Regained X lbs</u>					
5 lbs.	a	.124	-.227	-.719**	.243
10 lbs.	a	.284	-.267	-.794**	.225
20 lbs.	a	.458*	-.050	-.332	-.182
<u>DIET Subscales</u>					
<u>Time 1 (Mean)</u>					
Overeating	a	.048	.185	.138	.087
Resis. Temp.	a	-.007	.679**	.117	.160
Food Choice	a	-.132	.503*	.370	-.210
Pos. Soc. Eating	a	-.047	.675**	.122	.240
Neg. Emot. Eating	a	-.196	.363	.485*	.005
Exercise	a	-.186	.536*	.130	.492*
BDI (Time 1)	a	-.208	-.127	-.122	-.205
BDI (Time 2)	a	-.214	-.287	.004	-.531*

(*; p<.05; **; p<.01)

¹ History of Being Overweight = Subject reporting he or she has been overweight at some point.² Parents Overweight = Subject reporting at least one parent being overweight.³ Difference btwn. Actual Wt. and Ideal Wt. = Ideal Weight - Actual Weight (Time 1).

Table 17 Cont.

^a correlation could not be computed because all weight loss participants reported being overweight.

CHAPTER IV

DISCUSSION

This study was a prospective attempt to understand weight maintenance and weight fluctuation. The objective of this investigation was to examine predictors of weight fluctuation (i.e., gain or loss) in a large general/normal sample of college students and in a select group of weight loss maintainers. Factors associated with stress-induced eating in the laboratory and the relationship between depression and weight fluctuation were also examined.

Predicting Weight Fluctuations within the Normal/General

Sample

Weight Control Strategies

Findings from the applicable regression and discriminant analyses provide some support for the hypothesis that weight control strategies can predict weight fluctuation. The multiple regression analysis indicated that an inability to avoid eating in response to negative emotions and to resist food temptations were associated with increases in weight across the 6-month also revealed that four of the DIET subscales (Negative

Emotional Eating, Resisting Food Temptations, Overeating, and Positive Social Eating) made significant contributions to the formation of the function. However, none of these predictors were highly correlated with the function and, in comparison with the other important predictors used in this analysis (i.e, depression and amount of candy eaten in the laboratory), appear to be secondary predictors. Only a few research studies (e.g, Astrup et al., 1996; Dalton, 1997; McGuire et al., 1999) have examined the role dietary factors play in weight maintenance and fluctuation. These studies have examined the relationship between weight maintenance and dietary fat intake, in particular, and results from these studies have suggested daily fat intake plays an important role in weight maintenance and weight loss maintenance. Because the DIET inventory used in this study assesses eating behaviors in general, rather than consumption of specific high fat or low fat foods, findings from the present study cannot be directly compared with those of previous studies. Nonetheless, these results provide some evidence suggesting that dietary factors may be associated with weight fluctuation, and this appears consistent overall with previous research (e.g, Astrup et al., 1996; Dalton, 1997; McGuire et al., 1999). Future

studies examining the relationship between more general diet behaviors and weight fluctuation and maintenance are needed.

While the existing literature on the role of exercise in weight maintenance has largely been mixed, exercise (as measured by the DIET) was not found to be predictive of weight change in the individuals in this study. The DIET inquires about an individual's exercise habits (e.g., percent of time a person would set aside time each day for exercise, percent of time a person would walk to a store a couple of blocks away rather than drive). While the accuracy of such reports may be in question, findings from this study nevertheless appear consistent with findings from recent studies which have reported that exercise has little direct effect on weight loss (Garrow, 1995; Phinney, 1992).

Laboratory Stress-Induced Eating

The present study yielded support for the hypothesis that greater amounts of eating during a laboratory stressor would be associated with weight fluctuation across the 6-month assessment period. Findings from both the multiple regression and discriminant analyses suggested the importance of the laboratory eating measure as a predictor

of weight gain. These results are intriguing because of their relationship to the findings of previous studies. Previous studies examining stress-induced eating have typically compared obese and non-obese individuals and have suggested that stress-induced eating plays a minimal role in the development of obesity. Past research (e.g., Baucom & Aiken, 1981) has also suggested that other variables (i.e., dieting) may play a more important role in stress-induced eating than obesity. In other words, stress-induced eating may be more related to dietary restraint and only indirectly, if at all, related to obesity. The present study is the only examination of the role stress-induced eating might play in weight maintenance and fluctuation in a sample of young adults with normally distributed body weight. In such circumstances, it appears that eating during a laboratory stressor is related to weight gain over the relatively brief 6-month period assessed in this study. Stress-induced eating is likely just one of many pathways to obesity. It may be the case that a subset of obese individuals are stress-eaters and that stress-induced eating, because it is not controlled, is responsible for the development of obesity in such individuals. Physiological mechanisms such as set point

theory may explain why some stress-eaters become obese while others do not. For instance, it is possible that weight gains associated with stress-induced eating lead to new, increased set point weights in some individuals which, over time, result in an obese weight status. Research examining the relationship between stress-induced eating, set point weight, and obesity is needed. Furthermore, it is possible that a subset of stress-induced eaters fail to become obese because they control weight gain through compensatory behaviors to reduce caloric intake. Future studies examining these possible compensatory mechanisms among stress-eaters are also warranted.

A caveat to these findings should be noted. While greater food consumption within the context of this laboratory stressor was found to be associated with weight gain across the 6-month assessment period in this study, eating in the laboratory may not necessarily have been influenced by stress per se. It is possible that certain individuals are more likely than others to eat more or less in such a context, and a number of potential factors may influence such eating behavior (i.e., concern about eating in public, dietary restraint).

General Life Stress

Findings from this study failed to provide support for the hypothesis that global life stress would be associated with weight change across the 6-month assessment period. Life stress (as measured by the Hassles Total Score) was not found to be an individual predictor of weight change in the multiple regression analysis or the discriminant analysis, and none of the bivariate correlations between specific hassles subscales and 6-month weight change were found to be statistically significant. Because stress is likely to affect weight only if an individual responds to stressful events and situations by eating, failure to find an association between global life stress and weight change may indicate that stress-induced eating in particular, rather than stress in general is involved in weight fluctuations. As such, this finding provides indirect support for previous research which has concluded that certain individuals respond to stress by eating while others do not (Baucom & Aiken, 1981; Schlundt et al., 1991; Van Strien et al., 1986).

Weight Cycling

Findings from the present study also failed to support the hypothesis that a history of weight cycling would be

associated with weight change across the 6-month assessment period. Although the previous literature has been silent on this issue, I had rationalized that people with a history of weight cycling would be more likely to experience weight fluctuations across the 6-month assessment period. One possible explanation for the discrepancy between these data and my hypothesis is that those with a history of weight cycling were going through a weight stable period during this study's 6-month follow-up assessment. It is also possible that there was not a sufficient amount of time between the two assessments for a history of weight cycling to be revealed as a significant individual predictor of weight change. Lack of support for this hypothesis may also be related to how weight cycling was defined, with participants reporting the number of times they had lost and regained 5, 10, and 20 pounds. Such retrospective self-reports may, obviously, be inaccurate.

Depression

Findings from the regression and discriminant analyses pertaining to depression as a predictor of weight fluctuation yielded conflicting results within the current study. The multiple regression analysis failed to find

depression (as measured by the BDI-II at Time 1) to be a significant individual predictor of weight change by the 6-month assessment. However, the discriminant analysis indicated that greater levels of depression were associated with weight gain across the 6-month assessment period. Although this discrepancy is perplexing, one possibility is that the relationship between weight fluctuation and depression is not linear. Because depression was not a significant predictor of weight change in the multiple regression but was in the discriminant analysis, this study's analyses supported this possibility by suggesting a relationship between depression and weight gain but not between depression and weight loss and weight stability. Despite this possibility, it is probably best to view these results with caution.

Initial Weight and Weight Change in Men and Women

Some additional follow-up analyses were conducted to examine predictors of weight change separately in men and women, controlling for their initial weight levels. These analyses are provided and briefly discussed in Appendix N.

Predicting Weight Fluctuations within the Weight Loss
Maintainers

Proximity to Ideal Weight

Support was found for the hypothesis that proximity to ideal weight would be related to weight change across the 6-month assessment period in the weight loss maintainers in this study. While this variable was not found to be a significant individual predictor of weight change in the multiple regression analysis, a statistically significant bivariate correlation between proximity to ideal weight and weight change did emerge. This correlation suggested that the further above ideal weight these women were, the more likely they were to gain weight by the 6-month follow-up assessment. Such a result appears consistent with the findings of Wolfe (1992) which suggested that individuals who achieved their goal weight showed greater weight-related self-efficacy and were more likely to maintain a weight with which they were happy, while those failing to reach ideal weight abandoned weight loss efforts.

It is interesting to note that the relationship between proximity to ideal weight and weight change was also statistically significant in the general/normal sample, but the direction of the relationship between the

variables was reversed. Among the participants in the normal sample, being further above one's ideal weight was associated with increased weight loss by the 6-month follow-up assessment. Such a finding appears to make practical sense as the more weight an individual feels he or she needs to lose, the more likely he or she may be to engage in weight loss efforts and, as a result, decrease weight. This difference in the relationship between proximity to ideal weight and subsequent weight gain/loss found in the two samples in this study may simply reflect frustration and despair that can occur when an individual attempting to lose weight is not as successful as she would like to be. Nevertheless, the difference in the relationship between ideal weight and weight change in our two samples is interesting and additional research is needed to address how ideal weight affects weight change in normals, weight loss maintainers, obese individuals, and, perhaps, in individuals with clinically diagnosed eating disorders.

Social Support

It was hypothesized that receiving social support for weight loss efforts would be associated with continued maintenance of weight loss in the weight loss sample.

Findings from the current study provide some support for this hypothesis. While social support did not emerge as a statistically significant individual predictor of weight change in the multiple regression analysis, a significant bivariate correlation was revealed. This indicated that the women who received social support for their weight loss efforts were more likely to lose weight by the 6-month assessment than those not receiving such support. This finding is consistent with past studies which have reported that support for weight loss efforts by family members (Brownell, 1978; Dalton, 1997) and peers (Peri et al., 1984) is positively associated with continued weight loss maintenance.

Frequency of Weighing

This study failed to support the hypothesis that frequency of weighing would be associated with weight fluctuation across the 6-month assessment. While the existing literature has not addressed the relationship between frequency of weighing and weight loss maintenance, I had hypothesized that more frequent weighing might serve to keep the individual mindful of her weight and, therefore, be associated with continued weight loss across the 6-month assessment period. Obviously, failure to find

support for this hypothesis could be due to the fact that frequent weighing may also result in the individual feeling frustrated if she has gained weight or if her weight has remained stable in spite of efforts to continue losing weight. In such cases, frequent weighing may also be associated with abandoning weight loss strategies. Future studies examining individuals' behavioral and emotional responses to weighing are encouraged in order to better understand the role that weighing plays in weight loss maintenance as well as in weight maintenance in general.

Predicting Laboratory Stress-Induced Eating

The current study failed to find strong support for the hypothesis that having a history of weight cycling, decreased levels of dietary control, and greater levels of life stress would be associated with greater amounts of candy eaten in the laboratory. The multiple regression analysis using these variables as predictors of laboratory stress-induced eating was not found to be significant overall. However, statistically significant positive bivariate correlations did emerge between three of the Hassles subscales (Inner Concerns, Time Pressures, and Family Concerns) and the amount of candy eaten in the laboratory, providing some support for the hypothesis that

at least some types of life stress may increase the likelihood of responding to a specific stressful situation by overeating. What is particularly interesting about this finding, however, is that these types of stressors (inner concerns, time pressures, and family concerns) may not reflect environmental stress but rather may be confounded with psychological adjustment and symptoms of psychological distress such as anxiety and depression (Holm & Holroyd, 1992). The finding that depression was correlated with stress-induced eating supports this interpretation and suggests that these two findings may both reflect a tendency for psychologically distressed individuals to be susceptible to stress-induced overeating.

Finally, it should be noted that scores on the Focus and Production subscales of the Dimensional Coping Checklist were found to be significantly correlated with eating in the laboratory, indicating that coping style may discriminate stress-eaters from those who do not eat in response to stress. Specifically, it was found that those who focused on their environment and/or took a passive approach to managing the situation were more likely to overeat in response to the laboratory stressor. Future investigations are encouraged to explore the role coping

responses play in mediating the relationship between stress and eating.

Discriminating Weight Cyclers from Non-Cyclers

The discriminant analysis which was conducted to examine what differentiated weight cyclers from non-cyclers revealed that several predictors made significant contributions to the formation of the function. These predictors were: gender, depression (BDI-II Time I), general life stress (Hassles total score), and five of the DIET subscales (Overeating, Negative Emotional Eating, Resisting Temptation, Exercise, and Food Choice). These five DIET variables contributed to the function but were not highly correlated with it suggesting that they contributed in relatively minor ways and are secondary in importance to gender, depression, and life stress. Nonetheless, examination of the DIET variables as a whole suggests that weight cyclers are able to resist food temptations, to recognize healthy food choices, and to exercise but may also be more likely than non-cyclers to overeat and to eat in response to negative emotions. As such, these results may suggest the presence of a pattern of dietary restraint and binge-eating behavior among weight cyclers.

Results from this analysis also revealed that men, those experiencing greater levels of depression, and those reporting greater levels of general life stress were more likely to be weight cyclers. It seems reasonable to believe that because of differences in average height, build, and metabolism between men and women, losing and regaining 20 pounds may be accomplished more easily in men. It could also be more likely that men, compared to women, have been involved in athletics (i.e., wrestling, weight lifting) which have required them to gain and/or lose weight in order to make weight criteria needed to compete in such events. Furthermore, the finding that greater levels of depression are more common among weight cyclers than non-cyclers could be explained by the fact that weight change (i.e., gain or loss) is one symptom of depression (as measured by the BDI-II). However, feelings of depression may also be associated with dissatisfaction with one's body weight. Such dissatisfaction may lead to dietary restraint and subsequent binge-eating behavior which results in weight losses and regains (i.e., weight cycling). It is likely that these weight fluctuation episodes lead to continued, and perhaps, more severe levels of depression. Furthermore, general life stress could be

related to weight cycling through stress-induced eating. Perhaps, stress-induced eating leads to weight gains which are later reversed through physiological mechanisms attempting to return the body to its set point weight or through compensatory behaviors exhibited by the individual. Although these explanations are certainly speculative, the data analyses in this study show a fairly straightforward connection between gender, depression, life stress, and weight cycling suggesting that in a general population men who are depressed and experiencing higher levels of life stress report experiencing weight cycles of 20 pounds or more.

At this juncture, it seems appropriate to discuss the intriguing weight-related demographics which were reported by the men in this study. Surprisingly, the men were roughly equal to the women in their reports of proximity to ideal weight, with approximately 70% of both men and women reporting their current weight differed from their ideal weight by 10 or more pounds. A greater percentage of men than women also reported that they considered themselves to have been overweight at some point. Similarly, more men than women reported that they had experienced at least one weight cycle of 10 and 20 pounds each. Furthermore,

examination of annual weight reports across the past 5 years revealed that men had experienced more 10 pound weight fluctuations than had the women across this same period.

Perhaps, such findings provide support for an emerging literature which suggests that males, even at a very young age, are becoming more preoccupied with physical appearance and are experiencing greater levels of body image disturbances than they have historically in this culture (Cohane & Pope, 2001). It is also possible, however, that the greater reports of weight fluctuations in men may simply be due to the fact that men, on average, are taller and have larger body frames than women, making weight change potentially easier for men. It should be noted that height was not recorded and, therefore, could not be controlled for in this study. Furthermore, the higher rates of reported weight fluctuations over the past 5 years in the men may be associated with pubertal factors. During the 5 years prior to their participation in this study, these men and women ranged from 15 years of age to 19 years of age, on average, and, as such, weight gain in the men likely was associated with growth spurts; whereas, many

of the women had likely reached mature height at an earlier age.

Depression and Weight Change among Cyclers and Non-Cyclers

Finally, it was expected that weight gains would be associated with increased levels of depression among individuals with a history of weight cycling. Data analyses provided support for this hypothesis. In the general sample and in the sample of weight loss maintainers, bivariate correlations revealed a statistically significant relationship between weight gain and depression level among weight cyclers but not among non-weight cyclers.

Previous research on the relationship between weight cycling and psychological health, though scarce, has been mixed. Some researchers (e.g., Wadden & Wingate, 1995; Wadden, Stunkard, & Liebschutz, 1988) have reported that obese individuals who regained weight reported feeling guilty, ashamed, and inadequate and expressed decreased feelings of happiness and satisfaction with appearance. However, Bartlett, Wadden, and Vogt (1996) failed to find a significant relationship between weight cycling and psychological health in their comparison of obese individuals with mild, moderate, and severe histories of

weight cycling (as defined by the number of times an individual had lost and regained 5 pounds).

Despite previous conflicting results, depression and weight gain were clearly associated among weight cyclers in both the general and weight loss maintenance samples in the current study. Such a finding appears to be clinically relevant as an individual's history and current level of depression and his or her weight cycling history may be determinants of success and/or failure at losing weight and maintaining weight losses. Both of these issues (i.e., depression and weight cycling history) may be important topics for clinicians to address with individuals attempting to lose weight and depression level in those with a weight cycling history should be monitored, particularly as it related to weight gains which may occur throughout the course of a weight loss program.

It should be noted that the present study defined weight cyclers as those having lost and regained 20 pounds at least once. It is possible, therefore, that defining a weight cycle in terms of smaller amounts of weight lost and regained may not have resulted in a statistically significant correlation with depression. It is reasonable to believe that putting forth the effort required to lose

20 pounds only to regain the weight may be associated with depressive symptoms such as disappointment in self and hopelessness. Because larger weight losses and regains are more noticeable to others, it is also possible that individuals who have regained a large amount of weight (i.e., 20 lbs or more) have received negative comments from others as a result. Furthermore, it may be the case that individuals losing and regaining 20 pounds are heavier/more overweight than those who have not and, therefore, experience greater depression as a result of gaining additional weight. Future studies examining the role that family, peers, and society at large plays in psychological factors associated with weight regain are needed.

Limitations and Conclusions

The current study's results are obviously limited by the nature of the subject samples. The general/normal sample of participants was comprised of young, primarily Caucasian, men and women who were attending college. As such, this sample's relevance to older individuals, those from diverse racial and cultural backgrounds, and/or less educated individuals is unknown. Similarly, the weight loss sample consisted of young (though slightly older than those in the general sample), primarily Caucasian women.

The women in this sample had lost, on average, 36 pounds and had maintained this weight loss for 6 to 18 months prior to participating in this study. The generalizability of the present study's findings for this group are, therefore, limited by demographic characteristics such as gender, age, and race and by weight-relevant demographics such as the amount of weight loss and duration of weight loss maintenance. Thus, it is unclear how well these findings can be applied to individuals maintaining larger or smaller weight losses and/or weight loss maintenance of shorter or longer duration. The small sample size ($n = 19$) also limits the generalizability of this study's findings. Furthermore, it should be noted that many of the outcome measures used in this investigation were self-report and, as such, suffer from limitations associated with such measures.

In addition, this study's results for the normal sample of participants may be specific to the use of a laboratory stressor involving preparing and delivering a speech to another individual. It is possible that other results might be obtained with different types of laboratory stress-inductions (e.g., threat of shock, attempting to solve unsolvable puzzles). It should also be

clear that the extent to which eating behavior in response to the laboratory stress procedure used in this study can be generalized to real-life stressful situations is unknown. Participants in this study understood that they would be delivering their speech to another person for three minutes and that they could end their participation in this study at any time. As such, the stress experienced in this situation was known to be short-term and under the participant's full control, unlike many stressors individuals are confronted with in daily life. In addition, because participants were exposed to a stressful situation within the context of a laboratory setting (i.e., presence of other individuals who could potentially see them eating, type of food available) their eating behavior in the laboratory may not be reflective of their eating behavior in response to stress in a more natural setting.

Findings from this study extend the literature on weight maintenance and change. Results from this study suggest that dietary factors and stress-induced eating are associated with weight fluctuations in men and women. This study also provides evidence to suggest that proximity to ideal weight and social support for weight loss are related to continued weight loss among weight loss maintainers.

Furthermore, the present study adds to the existing literature on the relationship between weight cycling and psychological health, suggesting that increases in depression are associated with weight gain among weight cyclers but not among those without a weight cycling history. This finding occurred in both the general sample of participants as well as among the weight loss maintainers in this study.

Additional studies examining factors associated with stress-induced eating appear warranted given this study's findings that laboratory stress-induced eating was associated with weight fluctuations. Continued research examining weight cycling is needed, especially when considering the detrimental physical and psychological health consequences which have been found to be related to weight cycling. For instance, studies identifying risk factors associated with the development of a weight cycling pattern could be beneficial for establishing prevention programs.

APPENDICES

APPENDIX A

Informed Consent
(Form 1)

Introduction: This investigation is being conducted by Kelly Bishop, a graduate student in the Department of Psychology, under the supervision of Dr. Jeff Holm, a professor in the same department.

Project Description: You have been invited to participate in a study of stress and how individuals prepare for a stressful situation. You will be asked to complete four questionnaires and to prepare a brief presentation (3 minutes) on a controversial topic. You will be asked to choose to argue for or against capital punishment (i.e., the death penalty) and present this position to another subject. You will be given some materials to aid in preparing your talk, but you will not be able to refer to them during the presentation. The second subject will be of the same sex as you, but you will not know his or her opinion of the death penalty. He or she will not be permitted to argue with you during the presentation though he or she will be permitted to indicate that he or she agrees or disagrees with things you say. Following your presentation, you may or may not be asked to describe the feedback that was given to you by the other participant. This experiment should take about 30 minutes. Your honesty in completing all questionnaires is vital to our research and is greatly appreciated.

Confidentiality: All information obtained in connection with your responses will be kept confidential. Your data will be identified only by participant number, and all data will be kept in a locked file cabinet for three years following completion of this study. After this time, all information will be shredded. The consent form and the other questionnaires you complete will be assigned a code number by which they can be linked for the purposes of re-contacting you. The consent form will kept in a separate file cabinet apart from the other questionnaires you complete, and Kelly Bishop and Dr. Jeff Holm will be the only individuals with access to these locked files. Additionally, only group data (not your individual data)

will be presented to others in the form of papers or presentations which may result from this study.

Risks: You may feel uncomfortable filling out the psychological questionnaires used in this research. You could also experience distress associated with the reading materials pertaining to capital punishment and/or some distress delivering a presentation and receiving feedback during your presentation. In the event that you experience adverse effects as a result of your participation, you are encouraged to contact the Psychological Services Center (777-3691) or the Counseling Center (777-2127). If psychological services are sought, expenses associated with such services are your responsibility.

Benefits: You will receive course extra credit or \$5 cash payment for your participation in this study. If you are eligible for earning course extra credit (as determined by the professor(s) of your psychology course(s)), this is what you will receive. If, however, you are not eligible for earning course extra credit (again, as determined by your professor(s)), you will receive \$5 for participating. In addition, results from this investigation may lead to an increased understanding of how individuals handle stressful situations.

Voluntary Participation: You are free to decide whether or not to participate in this investigation. If you decide to participate in this study, you are free to withdraw from the study at any time without fear of reprimand of any kind and without fear of causing detriment to your standing in any class at the University of North Dakota. Additionally, while you are encouraged to respond to as many questionnaire items as you can, you should feel free to skip any items for which you do not feel comfortable responding.

Benefits: The investigators involved are able to answer any questions you may have concerning this project. In addition, you are encouraged to ask any questions you may have concerning this project in the future by contacting Kelly Bishop at 772-6177 or 777-6496, or you can contact Dr. Jeff Holm at 777-3792.

All of my questions have been answered, and I am encouraged to ask any additional questions that I have concerning this study in the future. I have read all of the above and willing agree to participate in this investigation.

Name (please print): _____ Date: _____

Signature: _____

APPENDIX B

The Hassles Scale

Participant #: _____ Date: _____ Age: _____ Sex: Male Female

Hassles are irritants that can range from minor annoyances to fairly major pressures, problems, or difficulties. They can occur few or many times. Listed in the center of the following pages are a number of ways in which a person can feel hassled. For each hassle, if it has not happened to you in the past month, indicate that it is not applicable by circling N/A. If it has happened to you in the past month, indicate by circling a 1, 2, 3, 4, or 5, how SEVERE it has been for you in the past month, according to the following answers.

- 1 = Not severe at all
- 2 = Somewhat severe
- 3 = Moderately severe
- 4 = Very severe
- 5 = Extremely severe

Remember, if it has not happened in the past month, simply circle N/A.

1. Misplacing or losing things	N/A	1	2	3	4	5
2. Troublesome neighbors	N/A	1	2	3	4	5
3. Social obligations	N/A	1	2	3	4	5
4. Inconsiderate smokers	N/A	1	2	3	4	5
5. Troubling thoughts about your future	N/A	1	2	3	4	5
6. Thoughts about death	N/A	1	2	3	4	5
7. Health of a family member	N/A	1	2	3	4	5
8. Not enough money for clothing	N/A	1	2	3	4	5
9. Not enough money for housing	N/A	1	2	3	4	5
10. Concerns about owing money	N/A	1	2	3	4	5
11. Concerns about getting credit	N/A	1	2	3	4	5
12. Concerns about money for emergencies	N/A	1	2	3	4	5
13. Someone owes you money	N/A	1	2	3	4	5
14. Financial responsibility for someone who doesn't live with you	N/A	1	2	3	4	5
15. Cutting down on electricity, water, etc	N/A	1	2	3	4	5
16. Smoking too much	N/A	1	2	3	4	5
17. Use of alcohol	N/A	1	2	3	4	5
18. Personal use of drugs	N/A	1	2	3	4	5
19. Too many responsibilities	N/A	1	2	3	4	5
20. Decisions about having children	N/A	1	2	3	4	5
21. Non-family members living in your house	N/A	1	2	3	4	5
22. Care for pet	N/A	1	2	3	4	5
23. Planning meals	N/A	1	2	3	4	5
24. Concerned about the meaning of life	N/A	1	2	3	4	5
25. Trouble relaxing	N/A	1	2	3	4	5
26. Trouble making decisions	N/A	1	2	3	4	5
27. Problems getting along with fellow workers	N/A	1	2	3	4	5
28. Customers or clients give you a hard time	N/A	1	2	3	4	5
29. Home maintenance (inside)	N/A	1	2	3	4	5
30. Concerns about job security	N/A	1	2	3	4	5
31. Concerns about retiring	N/A	1	2	3	4	5
32. Laid-off or out of work	N/A	1	2	3	4	5

N/A = Not applicable
 1 = Not severe at all
 2 = Somewhat severe
 3 = Moderately severe
 4 = Very severe
 5 = Extremely severe

33. Don't like current work duties.	N/A	1	2	3	4	5
34. Don't like fellow workers	N/A	1	2	3	4	5
35. Not enough money for basic necessities.	N/A	1	2	3	4	5
36. Not enough money for food	N/A	1	2	3	4	5
37. Too many interruption	N/A	1	2	3	4	5
38. Unexpected company.	N/A	1	2	3	4	5
39. Too much time on hands.	N/A	1	2	3	4	5
40. Having to wait.	N/A	1	2	3	4	5
41. Concerns about accidents.	N/A	1	2	3	4	5
42. Being late.	N/A	1	2	3	4	5
43. Not enough money for health care.	N/A	1	2	3	4	5
44. Fear of confrontation	N/A	1	2	3	4	5
45. Financial security.	N/A	1	2	3	4	5
46. Silly practical mistakes.	N/A	1	2	3	4	5
47. Inability to express yourself	N/A	1	2	3	4	5
48. Physical illness.	N/A	1	2	3	4	5
49. Side effects of medication.	N/A	1	2	3	4	5
50. Concerns about medical treatment.	N/A	1	2	3	4	5
51. Physical appearance	N/A	1	2	3	4	5
52. Fear of rejection	N/A	1	2	3	4	5
53. Difficulties with getting pregnant.	N/A	1	2	3	4	5
54. Sexual problems that result from physical problems	N/A	1	2	3	4	5
55. Sexual problems other than those resulting from physical problems	N/A	1	2	3	4	5
56. Concerns about health in general.	N/A	1	2	3	4	5
57. Not seeing enough people.	N/A	1	2	3	4	5
58. Friend or relatives too far away.	N/A	1	2	3	4	5
59. Preparing meals	N/A	1	2	3	4	5
60. Wasting time.	N/A	1	2	3	4	5
61. Auto maintenance.	N/A	1	2	3	4	5
62. Filling out forms.	N/A	1	2	3	4	5
63. Neighborhood deterioration.	N/A	1	2	3	4	5
64. Financing children's education.	N/A	1	2	3	4	5
65. Problems with employees	N/A	1	2	3	4	5
66. Problems on job due to being a man or a woman.	N/A	1	2	3	4	5
67. Declining physical abilities.	N/A	1	2	3	4	5
68. Being exploited	N/A	1	2	3	4	5
69. Concerns about bodily functions	N/A	1	2	3	4	5
70. Rising prices of common goods	N/A	1	2	3	4	5
71. Not getting enough rest	N/A	1	2	3	4	5
72. Not getting enough sleep.	N/A	1	2	3	4	5
73. Problems with aging parents	N/A	1	2	3	4	5
74. Problems with your children	N/A	1	2	3	4	5
75. Problems with persons younger than yourself	N/A	1	2	3	4	5

N/A = Not applicable
 1 = Not severe at all
 2 = Somewhat severe
 3 = Moderately severe
 4 = Very severe
 5 = Extremely severe

76. Problems with your lover.	N/A	1	2	3	4	5
77. Difficulties seeing or hearing	N/A	1	2	3	4	5
78. Overloaded with family responsibilities	N/A	1	2	3	4	5
79. Too many things to do	N/A	1	2	3	4	5
80. Unchallenging work.	N/A	1	2	3	4	5
81. Concerns about meeting high standards	N/A	1	2	3	4	5
82. Financial dealings with friends and acquaintances.	N/A	1	2	3	4	5
83. Job dissatisfactions.	N/A	1	2	3	4	5
84. Worries about decisions to change jobs.	N/A	1	2	3	4	5
85. Trouble with reading, writing, or spelling abilities.	N/A	1	2	3	4	5
86. Too many meetings	N/A	1	2	3	4	5
87. Problems with divorce or separation	N/A	1	2	3	4	5
88. Trouble with arithmetic skills.	N/A	1	2	3	4	5
89. Gossip.	N/A	1	2	3	4	5
90. Legal problems.	N/A	1	2	3	4	5
91. Concerns about inner conflicts.	N/A	1	2	3	4	5
92. Not enough time to do the things that you need to do.	N/A	1	2	3	4	5
93. Television.	N/A	1	2	3	4	5
94. Not enough personal energy.	N/A	1	2	3	4	5
95. Concerns about getting ahead.	N/A	1	2	3	4	5
96. Feel conflicted over what to do	N/A	1	2	3	4	5
97. Regrets over past decisions	N/A	1	2	3	4	5
98. Menstrual (period) problems	N/A	1	2	3	4	5
99. The weather	N/A	1	2	3	4	5
100. Nightmares	N/A	1	2	3	4	5
101. Concerns about getting ahead	N/A	1	2	3	4	5
102. Hassles from boss or supervisor.	N/A	1	2	3	4	5
103. Difficulties with friends.	N/A	1	2	3	4	5
104. Not enough time for family	N/A	1	2	3	4	5
105. Transportation problems.	N/A	1	2	3	4	5
106. Not enough money for transportation.	N/A	1	2	3	4	5
107. Not enough money for entertainment and recreation	N/A	1	2	3	4	5
108. Shopping	N/A	1	2	3	4	5
109. Prejudice and discrimination from others.	N/A	1	2	3	4	5
110. Property, investments, or taxes.	N/A	1	2	3	4	5
111. Not enough time for entertainment and recreation	N/A	1	2	3	4	5
112. Yardwork or outside home Maintenance.	N/A	1	2	3	4	5
113. Concerns about news events	N/A	1	2	3	4	5
114. Noise.	N/A	1	2	3	4	5
115. Crime.	N/A	1	2	3	4	5

- N/A = Not applicable
- 1 = Not severe at all
- 2 = Somewhat severe
- 3 = Moderately severe
- 4 = Very severe
- 5 = Extremely severe

- 116. Traffic. N/A 1 2 3 4 5
- 117. Pollution. N/A 1 2 3 4 5

HAVE WE MISSED ANY OF YOUR HASSLES? IF SO,
WRITE THEM IN BELOW:

- 118. _____ N/A 1 2 3 4 5

ONE MORE THING: HAS THERE BEEN A CHANGE IN YOUR LIFE
THAT AFFECTED HOW YOU ANSWERED THIS SCALE?
IF SO, TELL US WHAT IT WAS:

APPENDIX C

BDI-II

Participant #: _____

Instructions: This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the **one statement** in each group that best described the way you have been feeling during the **past two weeks, including today**. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

1. Sadness

- 0 I do not feel sad.
- 1 I feel sad much of the time.
- 2 I am sad all the time.
- 3 I am so sad or unhappy that I can't stand it.

2. Pessimism

- 0 I am not discouraged about my future.
- 1 I feel more discouraged about my future than I used to be.
- 2 I do not expect things to work out for me.
- 3 I feel my future is hopeless and will only get worse.

3. Past Failure

- 0 I do not feel like a failure.
- 1 I have failed more than I should have.
- 2 As I look back, I see a lot of failures.
- 3 I feel I am a total failure as a person.

4. Loss of Pleasure

- 0 I get as much pleasure as I ever did from the things I enjoy.
- 1 I don't enjoy things as much as I used to.
- 2 I get very little pleasure from the things I used to

enjoy.

3 I can't get any pleasure from things I used to enjoy.

5. Guilty Feelings

0 I don't feel particularly guilty.

1 I feel guilty over many things I have done or should have done.

2 I feel quite guilty most of the time.

3 I feel guilty all of the time.

6. Punishment Feelings

0 I don't feel I am being punished.

1 I feel I may be punished.

2 I expect to be punished.

3 I feel I am being punished.

7. Self-Dislike

0 I feel the same about myself as ever.

1 I have lost confidence in myself.

2 I am disappointed in myself.

3 I dislike myself.

8. Self-Criticalness

0 I don't criticize or blame myself more than usual.

1 I am more critical of myself than I used to be.

2 I criticize myself for all my faults.

3 I blame myself for everything bad that happens.

9. Suicidal Thoughts or Wishes

0 I don't have any thoughts of killing myself.

1 I have thoughts of killing myself, but wouldn't carry them out.

2 I would like to kill myself.

3 I would kill myself if I had the chance.

10. Crying

0 I don't cry any more than I used to.

1 I cry more than I used to.

2 I cry over every little thing.

3 I feel like crying, but I can't.

11. Agitation

0 I am no more restless or wound up than usual.

1 I feel more restless or wound up than usual.

2 I am so restless or agitated that it's hard to stay still.

3 I am so restless or agitated that I have to keep moving or doing something.

12. Loss of Interest

0 I have not lost interest in other people or activities.

1 I am less interested in other people or things than before.

2 I have lost most of my interest in other people or things.

3 It's hard to get interested in anything.

13. Indecisiveness

0 I make decisions about as well as ever.

1 I find it more difficult to make decisions than usual.

2 I have much greater difficulty in making decisions than I used to.

3 I have trouble making any decisions.

14. Worthlessness

0 I do not feel I am worthless.

1 I don't consider myself as worthwhile and useful as I used to be.

2 I feel more worthless as compared to other people.

3 I feel utterly worthless.

15. Loss of Energy

0 I have as much energy as ever.

1 I have less energy than I used to have.

2 I don't have enough energy to do very much.

3 I don't have enough energy to do anything.

16. Changes in Sleeping Pattern

- 0 I have not experienced any change in my eating pattern.
- 1a I sleep somewhat more than usual.
- 1b I sleep somewhat less than usual.
- 2a I sleep a lot more than usual.
- 2b I sleep a lot less than usual.
- 3a I sleep most of the day.
- 3b I wake up 1-2 hours early and can't get back to sleep.

17. Irritability

- 0 I am no more irritable than usual.
- 1 I am more irritable than usual.
- 2 I am much more irritable than usual.
- 3 I am irritable all the time.

18. Changes in Appetite

- 0 I have not experienced any change in my appetite.
- 1a My appetite is somewhat less than usual.
- 1b My appetite is somewhat greater than usual.
- 2a My appetite is much less than before.
- 2b My appetite is much greater than usual.
- 3a I have no appetite at all.
- 3b I crave food all the time.

19. Concentration Difficulty

- 0 I can concentrate as well as ever.
- 1 I can't concentrate as well as usual.
- 2 It's hard to keep my mind on anything for very long.
- 3 I find I can't concentrate on anything.

20. Tiredness or Fatigue

- 0 I am no more tired or fatigued than usual.
- 1 I get more tired or fatigued more easily than usual.
- 2 I am too tired or fatigued to do a lot of things I used to do.
- 3 I am too tired or fatigued to do most of the things I used to do.

21. Loss of Interest in Sex

- 0 I have not noticed any recent change in my interest in sex.
- 1 I am less interested in sex than I used to be.
- 2 I am much less interested in sex now.
- 3 I have lost interest in sex completely.

APPENDIX D

Reasons Some People Support Capital Punishment:

1. Deters people from committing crime.
2. Lex Talionis (a life for a life)
3. More humane than life imprisonment.
4. More economical than a life sentence.
5. Maximum public safety.
6. Instills a sense of respect for the law.

Reasons Some People are Against Capital Punishment

1. Chance for the convict to "pay back" society
2. Cruel and unusual punishment (violation of the 8th amendment)
3. It doesn't deter crime.
4. It's more costly than life imprisonment.
5. Violates human dignity/rights
6. Possibility of innocent death.

APPENDIX E

Arguments Supporting Capital Punishment

1. **Deterrence.** Fear of death deters people from committing crimes. More individuals would think twice before committing murder if they knew their own life was at stake. During highly publicized death penalty cases, homicide rate is found to go down, but it goes back up when the case is over. Attaching the death penalty to certain crimes exerts a positive moral influence by placing a stigma on certain crimes like manslaughter, resulting in attitudes of disgust and horror to such acts. Enforcing the death penalty may also increase number of model citizens and a better society through fear and intimidation.
2. **Lex Talionis (a life for a life).** Death is the only fitting punishment for taking another person's life. "An eye for an eye" is the only way to satisfy family members of the victim and society at large. The criminal brought this on himself or herself by committing this crime so they should get what they deserve. The person would be allowed to live a fairly decent life in prison and he or she does not deserve this.
3. **More humane than life imprisonment.** The death penalty does not constitute "cruel and unusual punishment." Execution is actually more humane than spending the rest of one's life in prison. Life in prison may be torturous.
4. **More economical than a life sentence.** If the death penalty did not exist, the only reasonable sentence for committing murder would be life imprisonment. This would be costly to tax payers, not only for the cost of housing and feeding the prisoner but because of the numerous appeals which wastes man hours and money. If there is not threat of death, the person who commits murder is almost guaranteed to be provided with a decent living environment until their next parole hearing. They are not getting the punishment they deserve. How will the victim's family feel about this unfit punishment?

5. **Maximum public safety.** Placing murderers in jail isn't a tough enough punishment. In jail, they would have the possibility of parole. If they happen to make it back out into society, who's to say that he or she wouldn't kill again. Of the 2,575 prisoners sentenced to death in 1992, 1 out of 11 has a prior conviction of homicide. This means that additional people had to die before these murderers were sentenced to death. By executing murderers the first time around, justice will be served and the victim's family and society would be helped knowing one less murderer is out in the streets.
6. **Instills a sense of respect for the law.** More timely enforcement of the death penalty would help reduce the crime problem by instilling a sense of respect for the law in that sentences are more than just words on a page. Crimes carry consequences which should be understood.

Arguments Against Capital Punishment

1. **Chance for the convict to "pay back" society.** The offender should be required to compensate the victim's family with the offender's own income from employment or community service. There is no doubt that someone can do more alive than dead. By working, the criminal inadvertently "pays back" society and also their victim and/or the victim's family. There is no reason for the criminal to receive any compensation for his work. Money is of no value in jail.
2. **Cruel and unusual punishment (violation of the 8th amendment).** The death penalty constitutes cruel and unusual punishment. The Eight Amendment of the U.S. Constitution, condemning cruel and unusual punishment, is used to protest capital punishment. Many executions last several minutes and result in physical evidence that the experience was not painless. Capital punishment is a euphemism for legally killing people and no one, not even the State, has the authority to play God.
3. **Death penalty does not deter crime.** Contrary to popular belief, the death penalty does not act as a deterrent to crime. Study after study have emphasized the lack of correlation between the threat of the death penalty and the occurrence of violent crime. For instance, Elrich

conducted studies spanning 25 years, 1957-1982, showing that in the first year of the study there were 8, 060 murders and 65 executions and in the last year of the study there were 22, 520 murders committed and 1 execution performed. The absence of deterrence is clearly shown.

4. **It's more costly than life imprisonment.** The belief that execution costs less than imprisonment is false. The cost of the apparatus and maintenance of procedures attending the death penalty, including death row and the endless appeals and legal machinery, far outweighs the expense of maintaining in prison the tiny fraction of criminals who would otherwise be slain.
5. **Violates human dignity/rights.** The death penalty demeans the moral order and execution is not legalized murder—nor is imprisonment legalized kidnapping—but it is the coldest, most premeditated form of homicide of all. It does something almost worse than lowering the state to the moral level of the criminal: it raises the criminal to the moral equality with the social order. Indeed, one of the ironies of capital punishment is that it focuses attention and sympathy on the criminal.
6. **Possibility of innocent death.** Sometimes a person may be put to death who is innocent. Though this has been found to be a rare occurrence, it has happened and executing just one innocent person is too many. Imagine if you were the wrongly accused or a family member of such a person. Capital punishment is, therefore, risky.

APPENDIX F

Subject# _____

Current Measure of Mood Survey

Right now I feel:

Confident-----Uncertain

1 2 3 4 5 6 7 8 9 10

Calm-----Nervous

1 2 3 4 5 6 7 8 9 10

Restful-----Energetic

1 2 3 4 5 6 7 8 9 10

Sad-----Happy

1 2 3 4 5 6 7 8 9 10

Relaxed-----Stressed

1 2 3 4 5 6 7 8 9 10

Aggressive-----Timid

1 2 3 4 5 6 7 8 9 10

APPENDIX G

**Examples of Acceptable Responses for Confederates to use
when giving negative feedback**

Negative Feedback: The following responses will be offered to subjects during their presentation: "I disagree with that point. I don't believe that. I don't agree with your point. I think your point overstates/oversimplifies the issue. I don't think I agree with your point. I don't buy your argument."

APPENDIX H

Dimensional Coping Checklist

Please place an "X" beside all phrases that describe your thoughts or actions during the time when you were preparing for the presentation, presenting it, or for the time immediately afterwards.

- I was... _____ watching things happen around me.
_____ distracting myself.
_____ paying attention to my emotions.
_____ asking someone for help or support.
_____ turning away from the situation.
_____ doing whatever I was told.
_____ trying to find out more information.
_____ stopping my unpleasant thoughts.
_____ hoping things will work out.
_____ analyzing details of the situation.
_____ holding back my emotions.
_____ accepting things as they happened
_____ noticing my body sensations.
_____ praying silently for help or guidance.
_____ trying to see the positive side.
_____ preparing myself for things to come.
_____ letting things happen.
_____ rehearsing plans in my mind.

- _____ controlling my actions.
- _____ showing my emotions.
- _____ avoiding unpleasant sights or sounds.
- _____ changing things to better suit me.
- _____ calming my physical reactions.
- _____ imagining that I was elsewhere.

APPENDIX I

Informed Consent
(Form 2)

Introduction: This investigation is being conducted by Kelly Bishop, a graduate student in the Department of Psychology, under the supervision of Dr. Jeff Holm, a professor in the same department.

Project Description: You have been invited to participate in a study examining the relationship between psychological factors and health behaviors. Your participation in this project will consist of completing two questionnaires and then being weighed. This experiment should take about 20-30 minutes. In addition, you will be contacted in six months to see if you are willing to return to the laboratory to complete two additional questionnaires and again be weighed. Your honesty in completing all questionnaires is vital to our research and is greatly appreciated.

Confidentiality: All information obtained in connection with your responses will be kept confidential. All data will be kept in a locked file cabinet for three years following completion of this study. After this time, all information will be shredded. This consent form and the other questionnaires you complete will be assigned a code number by which they can be linked for the purposes of re-contacting you. The consent form will be kept in a separate file cabinet apart from the other questionnaires you complete, and Kelly Bishop and Dr. Jeff Holm will be the only individuals with access to these locked files. Additionally, only group data (not your individual data) will be presented to others in the form of papers or presentations which may result from this study.

Risks: You may feel uncomfortable filling out the psychological questionnaires used in this research. You could also experience distress associated with the reading materials pertaining to capital punishment and/or some distress delivering a presentation and receiving feedback during your presentation. In the event that you experience adverse effects as a result of your participation, you are encouraged to contact the Psychological Services Center

(777-3691) or the Counseling Center (777-2127). If psychological services are sought, expenses associated with such services are your responsibility.

Benefits: You will receive course extra credit or \$5 cash payment for your participation in this study. If you are eligible for earning course extra credit (as determined by the professor(s) of your psychology course(s)), this is what you will receive. If, however, you are not eligible for earning course extra credit (again, as determined by your professor(s)), you will receive \$5 for participating. In addition, results from this investigation may lead to an increased understanding of how individuals handle stressful situations.

Voluntary Participation: You are free to decide whether or not to participate in this investigation. If you decide to participate in this study, you are free to withdraw from the study at any time without fear of reprimand of any kind and without fear of causing detriment to your standing in any class at the University of North Dakota. Additionally, while you are encouraged to respond to as many questionnaire items as you can, you should feel free to skip any items for which you do not feel comfortable responding.

Benefits: The investigators involved are able to answer any questions you may have concerning this project. In addition, you are encouraged to ask any questions you may have concerning this project in the future by contacting Kelly Bishop at 772-6177 or 777-6496, or you can contact Dr. Jeff Holm at 777-3792.

All of my questions have been answered, and I am encouraged to ask any additional questions that I have concerning this study in the future. I have read all of the above and willing agree to participate in this investigation.

Name (please print): _____ Date: _____

Signature: _____

APPENDIX J

Subject # _____

Survey of Background Information and Weight History

Please answer the following questions. Your responses will be kept confidential. Honest and thought-out responses are vital to our research. Thank you for your cooperation.

1. What is your gender? (circle one) Male Female
2. What race do you consider yourself? _____
3. What is your age now? _____
4. What is your marital status? (circle one)
Single Single (but cohabiting with partner) Married
Divorced Widowed
5. How many children do you have? _____
6. Have you ever been overweight by at least 10 lbs. as a child or 15 lbs. as an adult? _____
7. If you have been overweight, at what age did you first become (or consider yourself to be) overweight? _____
8. What is the highest weight you can recall having weighed? _____
9. Were either of your parents ever overweight? _____
If yes, who? (circle one) Father Mother Both
10. How many times have you lost 20 or more lbs (when not physically ill) and then gained it back? _____
How many times have you lost 10 or more lbs (when not physically ill) and then gained it back? _____
How many times have you lost 5 or more lbs (when not physically ill) and then gained it back? _____

11. Try to recall your approximate weight on January 1st of the past 5 years.

How much do you believe you weighed on January 1 2000? _____

How much do you believe you weighed on January 1 1999? _____

How much do you believe you weighed on January 1 1998? _____

How much do you believe you weighed on January 1 1997? _____

How much do you believe you weighed on January 1 1996? _____

12. Do you consider yourself to be at your ideal weight now?

Yes No

If you answered no, what do you think would be your ideal weight? _____

13. How frequently do you weigh yourself? (circle one)

Less than once a month Monthly Biweekly Weekly

A few times a week Daily More than once per day

Stop here unless you were instructed to complete the final item.

14. While losing weight, did you receive support for your efforts by: (circle all that apply)

another individual (i.e., family member or friend) who was also attempting to lose weight

another individual (i.e., family member or friend) who supported your efforts but were not themselves trying to

reduce weight

If you did not receive positive support for weight loss from other individuals please place an "x" in the space provided: _____

APPENDIX K

Participant #: _____

Dieter's Inventory of Eating Temptations (DIET)

Each item in this questionnaire describes a situation and a behavior that promotes weight loss or weight control. Imagine that you are in the situation described and rate the percent of time you would behave in the way described. If you would always act in the way described then give a rating of 100%. If you would never act in that way give a rating of 0%. If you would sometimes act in that way then mark an "X" at the point on the scale that shows how often you would act as described. If you feel that you never get into a situation like the one described (it does not apply to you), then rate how often you engage in the kind of behavior described in general.

1. You're having dinner with your family and your favorite meal has been prepared. You finish the first helping and someone says, "Why don't you have some more?" What percent of the time would you turn down a second helping?

0 10 20 30 40 50 60 70 80 90 100

2. You would like to exercise every day but it is hard because of your family and work obligations. What percent of the time would you set aside a daily time for exercise?

0 10 20 30 40 50 60 70 80 90 100

3. You like to eat high calorie snack foods (e.g., cookies, potato chips, crackers, cokes, beer, cake) while watching television. What percent of the time would you watch TV without eating a high calorie snack?

0 10 20 30 40 50 60 70 80 90 100

4. When you eat in a good restaurant, you love to order high calorie foods. What percent of the time would you order a low calorie meal?

0 10 20 30 40 50 60 70 80 90 100

5. When planning meals you tend to choose high calorie foods. What percent of the time would you plan low calorie meals?

0 10 20 30 40 50 60 70 80 90 100

6. You are at a party and there is a lot of fattening food. You have already eaten more than you should and you are tempted to continue eating. What percent of the time would you stop with what you have already eaten?

0 10 20 30 40 50 60 70 80 90 100

7. You like to flavor your vegetables with butter, margarine, ham, or bacon fat. What percent of the time would you choose a low calorie method of seasoning?

0 10 20 30 40 50 60 70 80 90 100

8. You often prepare many of your foods by frying. What percent of the time would you prepare your food in a way that is less fattening?

0 10 20 30 40 50 60 70 80 90 100

9. You allow yourself a snack in the evening but you find yourself eating more than you diet allows. What percent of the time would you prepare your food in a way that is less fattening?

0 10 20 30 40 50 60 70 80 90 100

10. Instead of putting foods away after finishing a meal, you find yourself eating the leftovers. What percent of the time would you put food away without eating any?

0 10 20 30 40 50 60 70 80 90 100

11. You are asked by another person to go for a walk but you feel tired and kind of low. What percent of the time would you overcome these feelings and say "yes" to the walk?

0 10 20 30 40 50 60 70 80 90 100

12. You often overeat at supper because you are tired and hungry when you get home. What percent of the time would you not overeat at supper?

0 10 20 30 40 50 60 70 80 90 100

13. When you have errands to run that are only a couple of blocks away you usually drive your car. What percent of the time would you walk on an errand when it only involves a couple of blocks?

0 10 20 30 40 50 60 70 80 90 100

14. You are invited to someone's house for dinner and your host is an excellent cook. You often overeat because the food tastes so good. What percent of the time would you not overeat as a dinner guest?

0 10 20 30 40 50 60 70 80 90 100

15. You like to have something sweet to eat on your coffee break. What percent of the time would you only have coffee?

0 10 20 30 40 50 60 70 80 90 100

16. When you cook a meal you snack on the food. What percent of the time would you wait until the meal is prepared to eat?

0 10 20 30 40 50 60 70 80 90 100

17. You planned to exercise after work today but you feel tired and hungry when the time arrives. What percent of the time would you exercise anyway?

0 10 20 30 40 50 60 70 80 90 100

18. There is a party at work for a co-worker and someone offers you a piece of cake. What percent of the time would you turn it down?

0 10 20 30 40 50 60 70 80 90 100

19. You would like to climb the stairs instead of taking the elevator. What percent of the time would you take the stairs to go one or two flights?

0 10 20 30 40 50 60 70 80 90 100

20. You are happy and feeling good today. You are tempted to treat yourself by stopping for ice cream. What percent of the time would you find some other way to be nice to yourself?

0 10 20 30 40 50 60 70 80 90 100

21. You are at a friend's house and your friend offers you a delicious looking pastry. What percent of the time would you refuse this offer?

0 10 20 30 40 50 60 70 80 90 100

22. You feel like celebrating. You are going out with friends to a good restaurant. What percent of the time would you celebrate without overeating?

0 10 20 30 40 50 60 70 80 90 100

23. You finished your meal and you still feel hungry. There is cake and fruit available. What percentage of the time would you choose the fruit?

0 10 20 30 40 50 60 70 80 90 100

24. You are at home feeling lonely, blue, and bored. You are craving something to eat to make yourself feel better. What percent of the time would you find another way of coping with these feelings besides eating?

0 10 20 30 40 50 60 70 80 90 100

25. Today you did something to hurt your ankle. You want to get something to eat to make yourself feel better. What percent of the time would you find some other way to take your mind off the mishap?

0 10 20 30 40 50 60 70 80 90 100

26. When you spend time alone at home you are tempted to snack. You are spending an evening alone. What percent of the time would you resist the urge to snack?

0 10 20 30 40 50 60 70 80 90 100

27. You are out with a friend at lunch time and your friend suggests that you stop and get some ice cream. What percent of the time would you resist the temptation?

0 10 20 30 40 50 60 70 80 90 100

28. You just had an upsetting argument with a family member. You are standing in front of the refrigerator and you feel like eating everything in sight. What percent of the time would you find some other way to make yourself feel better.

0 10 20 30 40 50 60 70 80 90 100

29. You are having a hard day at work and you are anxious and upset. You feel like getting a candy bar. What percent of the time would you find a more constructive way to calm down and cope with your feelings?

0 10 20 30 40 50 60 70 80 90 100

30. You just had an argument with your (husband, wife, boyfriend, girlfriend). You are upset and angry, and you feel like eating something. What percent of time would you talk the situation over with someone or go for a walk instead of eating?

0 10 20 30 40 50 60 70 80 90 100

APPENDIX L

Debriefing Form

Now that you have completed this study, we can inform you of its details. This study contained two related components. The initial study that you completed six months ago where you prepared and delivered a presentation pertaining to one side of the capital punishment issue was actually measuring your eating behavior (i.e., the amount of candy you ate) in the context of this stressful situation. It was our intention to look at the relationship between stress and eating. Of course, we could not have informed you beforehand that we were actually interested in the amount of candy you would eat because this would have likely affected the amount of candy you consumed. We were also concerned that if we revealed this deception to participants before all data from the initial phase of the study was collected that the true intention of this study may have spread to other potential participants and, therefore, minimized the integrity of our investigation. In order to get an accurate measure of the individual's eating behavior associated with stress, use of deception was, therefore, necessary. You should also know that the participant to whom you delivered your speech was actually a confederate of the experimenter's (not a real participant), that the feedback you received was determined beforehand, and that all participants received the same feedback (regardless of the position they supported in their speech). Because you were not aware that you were being deceived, we are asking for your permission to use your data and to combine your data from the two parts of this study. If you prefer that your data not be used, we will comply with your wishes and immediately shred your data. We understand that being deceived can be uncomfortable, and we encourage you to express such concerns with the experimenter at this point, and if you have concerns about this in the future, you are encouraged to contact Kelly Bishop or Dr. Jeff Holm using the information provided in your copy of the consent form. Thank you for participating in this study.

APPENDIX M

Permission Form

The objective of this study has been clearly stated to me. I have been informed that deception was used in this study and reasons for using deception have also been explained. I am now aware that this study consists of three related components. Now that the experimenter has explained all this to me:

_____ I give consent to the experimenter to use my data and to combine data collected from the three parts of this study.

_____ I do not consent to having my data used and want all of the data collected from me shredded immediately.

Signature: _____ Date: _____

APPENDIX N

Predicting Weight Change in Men

A history of weight cycling¹, DIET subscale scores, the DHS total score, the amount of candy consumed during the laboratory stressor, BDI-II scores, and participants' weights at the first assessment were used as prospective predictors of weight change during the six-month period. This simultaneous regression analysis yielded a statistically significant model [$F(13, 101) = 2.0042, p < .05, \text{ and } R^2 = .232$]. Examination of individual predictors revealed that the amount of candy eaten in the laboratory was a significant individual predictor [Beta = .320, Part Correlation = .316, Zero-order Correlation = .325]. The number of times these men had lost and regained 5 pounds was also found to be a significant individual predictor [Beta = .251, Part Correlation = .244, Zero-order correlation = .257].

Predicting Weight Change in Women

The same predictors that were used in the multiple regression analysis to predict weight change in men were also used as predictors of 6-month weight change in women. This simultaneous multiple regression analysis, however, did not

¹History of Weight Cycling = number of times subject lost and regained 5, 10 and 20 lbs.

yield a statistically significant overall model [$F(13, 174) = 1.593$, $p = .092$, and $R^2 = .114$].

For men, the above analysis suggests that controlling for initial weight yields a slightly different picture from the analyses reported in the main body of this paper.

Nevertheless, the overall regression equation was still found to be significant, and the amount of candy eaten in the laboratory remained a significant individual predictor of weight change. However, the number of times these men had lost and regained 5 pounds emerged as a significant individual predictor of weight change while the two DIET subscales (Negative Emotional Eating and Resisting Temptation) were no longer revealed as significant individual predictors.

For the women, differences between the original analyses and the analysis controlling for initial weight level were more substantial in that the overall model in the current analysis was not statistically significant. However, examination of individual predictors suggested that the pattern of results appeared to be more similar, perhaps, than it was for the men.

The most notable difference between men and women was that initial body weight was not found to be at all important for predicting weight change in men, but it was revealed as a

good (but not statistically significant) predictor of weight change in women.

Comparing results from the original analyses with the current ones suggests that gender may be important such that weight change in men was best predicted by the amount of candy consumed in the laboratory and the number of times they had lost and regained 5 pounds while the amount of candy consumed in the laboratory and diet strategies appeared to be important predictors of weight fluctuation in women. Future studies are encouraged to examine predictors of weight fluctuation separately in men and women.

REFERENCES

- Abramson, E.E., & Wunderlich, R.A. (1972). Anxiety, fear and eating: A test of the psychosomatic concept of obesity. Journal of Abnormal Psychology, 79, 317-321.
- Angel, L. (1939). Constitution in female obesity. American Journal of Physiological Anthropology, 7, 433-471.
- Antleman, S.M., Szechtman, H., Chin, P., & Fisher, A.E. (1975). Tail pinch-induced eating, gnawing, and licking behavior in rats: Dependence on the nigrostriatal dopamine system. Brain Research, 99, 319-337.
- Aplefbaum, M., Bostsarron, J., & Lacatis, D. (1971). Effect of calorie restriction and excessive caloric intake on energy expenditure. American Journal of Clinical Nutrition, 24, 1405-1409.
- Bartlett, S.J., Wadden, T.A., & Vogt, R.A. (1996). Psychosocial consequences of weight cycling. Journal of Consulting and Clinical Psychology, 64(3), 587-592.
- Baucom, D.H., & Aiken, P.A. (1981). Effect of depressed mood on eating among obese and nonobese dieting and nondieting persons. Journal of Personality and Social Psychology, 41, 577-585.

Bauer, J. (1945). Constitution and disease. New York: Grune & Stratton.

Beck, A.T., Steer, R.A., & Brown, G.K. (1996). Beck Depression Inventory (Second Edition). The Psychological Corporation: Harcourt Brace.

Bellisle, F., Louis-Sylvestre, J., Linet, N., Rocaboy, B., Dalle, B., Cheneau, F., L'Hinore, D., & Guyot, L. (1990). Anxiety and food intake in men. Psychosomatic Medicine, 52, 452-457.

Black, D.R. (1989). Identifying predictors variables of weight loss outcome: Implications for a stepped program and weight management. Psychology and Health, 3, 207-216.

Bouchard, C., Tremblay, A., Despres, J.P., Nadeau, A., Lupien, P.J., Theriault, G., Dussault, J., Moorjani, S., Pineault, S., & Fournier, G. (1990). The response to long-term overfeeding in identical twins. New England Journal of Medicine, 322, 1477-1482.

Bray, G.A. (1969). Studies on the composition of adipose tissue from the genetically obese rats. Science, 197, 393-396.

Bray, G.A. (1976). The obese patient. Philadelphia: W.B. Saunders Co.

Bray, G.A. (1986). Overweight is risking fat: Definition, classification, prevalence, and risks. Annals of the New York Academy of Science, 14-20.

Bray, G.A. (1994). Etiology and prevalence of obesity. In C. Bouchard (Ed.) The genetics of obesity. Boca Raton: CRC.

Brook, C.G.D., Huntley, R.M.C., & Slack, J. (1975). Influence of heredity and environment in determination of skinfold thickness in children. British Journal of Medicine, 2, 719-721.

Brownell, K.D. (1995). Effects of weight cycling on metabolism, health, and psychological factors. In K.D. Brownell and C.G. Fairburn (Eds.) Eating disorders and obesity: A comprehensive handbook. New York: Guilford.

Brownell, K.D., Greenwood, M.R.C., Stellar, E., & Shrager, E.E. (1986). The effects of repeated cycles of weight loss and regain in rats. Physiology and Behavior, 38, 459-464.

Brownell, K.D., Marlatt, G.A., Lichtenstein, E., & Wilson, G.T. (1986). Understanding and preventing relapse. Addictive Behaviors, 41, 765-782.

Brownell, K.D., & Rodin, J. (1994). Medical, metabolic, and psychological effects of weight cycling. Archives of Internal Medicine, 154, 1325-1330.

Bruch, H. (1961). Transformation of oral impulses in eating disorders: A conceptual approach. Psychiatry Quarterly, 35, 458-481.

Bryner, R.W., Toffle, R.C., Ullrich, I.H., & Yeater, R.A. (1997). The effects of exercise intensity on body composition, weight loss, and dietary composition in women. Journal of the American College of Nutrition, 16(1), 68-73.

Cannon, W.B. (1939). The wisdom of the body. New York: W.W. Norton.

Cohane, G.H., & Pope, H.G. (2001). Body image in boys: A review of the literature. International Journal of Eating Disorders, 29(4), 373-379.

Colvin, R.H., & Olson, S.B. (1983). A descriptive analysis of men and women who have lost significant weight and are highly successful at maintaining the loss. Addictive Behaviors, 8, 287-295.

Colvin, R.H., & Olson, S.B. (1984). Winners revisited: An 18-month follow-up of our successful weight losers. Addictive Behaviors, 9, 305-306.

Dalton, S (1997). Overweight and weight management: The health professional's guide to understanding and practice. New York: Aspen.

Edell, B.H., Edington, S., Herd, B., O'Brien, R.M., & Witkin, G. (1987). Self-efficacy and self-motivation as predictors of weight loss. Addictive Behaviors, 12, 63-66.

Flatt, J.P, Ravussin, E., Acheson, K.J., & Jequier, E. (1985). Effects of dietary fat on postprandial substrate oxidation and on carbohydrate and fat balances. Journal of Clinical Investigations, 76, 1019-1024.

Foreyth, J.P. (1987). Issues in the assessment and treatment of obesity. Journal of Consulting and Clinical Psychology, 55(5), 677-684.

Foreyth, J.P., Brunner, R.L., Goodrick, G.K., Cotter, G., Brownell, K.D. & St. Jeor, S.T. (1995). Psychological correlates of weight fluctuation. International Journal of Eating Disorders, 17, 263-275.

Foster, G.D., Wadden, T.A., Kendall, P.C., Stunkard, A.J., & Vogt, R.A. (1996). Psychological effects of weight loss and regain. Journal of Consulting and Clinical Psychology, 64(4), 752-757.

Garrow, J.S. (1979). Energy balance and obesity in man. (2nd ed.). Amsterdam: Elsevier.

Garrow, J.S. (1995). Exercise in the treatment of obesity: A marginal contribution. International Journal of Obesity, 19 (Suppl. 4), S126-S129.

George, L.K. (1989). Stress, social support and depression over the life course. In K.S. Markides & C.L.Cooper (Eds.) Aging, stress, and health (pp. 241-267). New York: Wiley.

Gormally, J., Rardin, D, & Black, D. (1980). Correlates of successful response to a behavioral weight control clinic. Journal of Counseling Psychology, 27, 179-191.

Greeno, C.G., & Wing, R.R. (1994). Stress-induced eating. Psychological Bulletin, 115(3), 444-464.

Grilo, C.M., Brownell, K.D., & Stunkard, A.J. (1993). The metabolic and psychological importance of exercise in weight control. In A.J. Stunkard and T.A. Wadden (Eds.). Obesity: Theory and therapy (pp. 253-273). New York: Raven Press.

Gurney, R. (1936). Heredity factor in obesity. Archives of Internal Medicine, 57, 557-561.

Hartman, W.M., Stroud, M., Sweet, D.M., & Saxton, J. (1993). Long-term maintenance of weight loss following supplemented fasting. International Journal of Eating Disorders, 14, 87-93.

Hill, J.O., Schlundt, D.G., Sbrucco, T., Sharp, T., Pope-Cordel, J., Stetson, B., Kaler, M., & Heim, C. (1989). Evaluation of an alternating-calorie diet with and without exercise in the treatment of obesity. American Journal of Clinical Nutrition, 50, 248-254.

Hirsch, J., & Knittle, J.L. (1970). Cellularity of obese and non-obese human adipose tissue. Feeding Processes, 29, 1516-1521.

Holm, J.E., & Holroyd, K.A. (1992). The Daily Hassles Scale (Revised): Does it measure stress or symptoms? Behavioral Assessment, 14, 465-482.

Iversen, T. (1953). Psychogenic obesity in children. New England Journal of Medicine, 274, 622-673.

Jeffrey, R.W., Bjornson-Benson, W., Rosenthal, B.S., Lindquist, R.A., Kurth, C.L., & Johnson, S.L. (1984). Correlates of weight loss and its maintenance over two years of follow-up among middle aged men. Preventative Medicine, 13, 155-168.

Jeffrey, R.W., Wing, R.R., & French, S.A. (1992).
Weight cycling and cardiovascular risk factors in obese men
and women. American Journal of Clinical Nutrition, 88, 641-
644.

Kaplan, H.I., & Kaplan, H.S. (1957). The
psychosomatic concept of obesity. Journal of Nervous and
Mental Disorders, 125, 181-201.

Kayman, S., Bruvold, W., & Stern, J.S. (1990).
Maintenance and relapse after weight loss in women:
Behavioral aspects. American Journal of Clinical Nutrition,
52, 800-807.

Keesey, R.E. (1980). A set-point analysis of the
regulation of body weight. In A.J. Stunkard (Ed.) Obesity
(pp. 144-165). Philadelphia: W.B. Saunders.

Keesey, R.E. (1995). A set-point model of body weight
regulation. In K.D. Brownell & C.G. Wilson (Eds.) Eating
disorders and obesity: A comprehensive handbook. New York:
Guilford.

Keys, A, Brozek, J., Heschel, A., Michelson, O., &
Taylor, H.L. (1950). The biology of human starvation.
Vols 1 and 2. Minneapolis: University of Minnesota Press.

Lee, I.M., & Paffenbarger, R.S. (1992). Change in body weight and longevity. Journal of American Medical Association, 268, 2045-2049.

Lissner, L., Levitsky, D.A., Strupp, B.J., Kalkward, H.J., & Roe, D.A. (1987). Dietary fat and the regulation of energy intake in human subjects. American Journal of Clinical Nutrition, 46, 336-892.

Lissner, L., & Heitmann, B.L. (1995). Dietary fat and obesity: Evidence from epidemiology. European Journal of Clinical Nutrition, 49, 79-90.

Lowe, M.R., & Fisher, E.B. (1983). Emotional reactivity, emotional eating, and obesity: A naturalistic review. Journal of Behavioral Medicine, 6, 135-149.

Mayer (1975). Obesity during childhood. In M. Winick (Ed.) Current concepts in nutrition. New York: Wiley.

McKenna, R.J. (1972). Some effects of anxiety level and food cues on the eating behavior of obese and normal subjects: A comparison of the Schacterian and psychosomatic conceptions. Journal of Personality and Social Psychology, 22, 311-319.

Morley, J.D., & Levine, A.S. (1980). Stress-induced eating is mediated through endogenous opiates. Science, 209, 1259-1261.

Morley, J.D., Levine, A.S., & Rowland, N.E. (1983).
Stress-induces eating. Life Sciences, 32, 2169-2182.

Morley, J.D., Levine, A.S., & Willenbring, M.L.
(1986). Stress-induced feeding disorders. In M.O. Carruba
& J.E. Blundell (Eds.), Pharmacology of eating disorders:
Theoretical and clinical developments (pp. 71-99). New
York: Raven Press.

National Institutes of Health Consensus Development
Panel on the Health Implications of Obesity (1985). Health
implications of obesity: National Institutes of Health
Consensus Development Conference Statement. Annals of
Internal Medicine, 103, 1073-1077.

National Task Force on the Prevention and Treatment of
Obesity. (1994). Weight cycling. Journal of American
Medical Association, 272, 1196-1202.

Nemeroff, C.B., Osbahr, A.J.III, Bissette, G., Jahnke,
G., Lipton, A., & Prange, A.J. Jr. (1978). Cholecystokinin
inhibits tail pinch-induced eating in rats. Science, 200,
793-794.

Pavlou, K.N., Krey, S., & Steffee, W.P. (1989).
Exercise as an adjunct to weight loss and maintenance in
moderately overweight subjects. American Journal of
Clinical Nutrition, 49, 1115-1123.

Perri, M.C., McAdoo, W.G, Spevak, P.A., & Newlin, D.B. (1984). Enhancing the efficacy of behavior therapy for obesity: Effects of a multicomponent maintenance program on long-term weight loss. Journal of Consulting and Clinical Psychology, 52, 404-413.

Perri, M.G. (1995). Methods for maintaining weight loss. In K.D. Brownell and C.G. Fairburn (Eds.) Eating disorders and obesity (pp. 547-551). New York: Guilford.

Phinney, S. (1992). Exercise in the treatment of obesity. Journal of the Florida Medical Association, 79(6), 400-402.

Pine, C.J. (1985). Anxiety and eating behavior in obese and nonobese American Indians and white Americans. Journal of Personality and Social Psychology, 49, 774-780.

Pronk, N.P., & Wing, R.R. (1994). Physical activity and long term-maintenance of weight loss. Obesity Research, 2, 587-599.

Racette, S.B., Schoeller, D.A., Kushner, R.F., & Neil, K.M. (1995). Exercise enhances dietary compliance during moderate energy restriction in obese women. American Journal of Clinical Nutrition, 62, 345-349.

Reznick, H., & Balch, P. (1977). The effects of anxiety and response cost manipulations on the eating behavior of obese and normal weight subjects. Addictive Behaviors, 2, 219-225.

Rodin, J. (1975). The effects of obesity and set-point on taste responsiveness and intake in humans. Journal of Compositions in Physiological Psychology, 89, 1001-1009.

Rodin, J. (1975). Causes and consequences of time perception differences in overweight and normal weight people. Journal of Personality and Social Psychology, 31, 898-910.

Rodin, J., Elias, M., Silberstein, L.R., & Wagner, A. (1988). Combined behavioral and pharmacologic treatment for obesity: Predictors of successful weight maintenance. Journal of Consulting and Clinical Psychology, 56, 300-404.

Rony, H.R. (1940). Obesity and leanness. Philadelphia: Lea & Febinger.

Rossi, J.S. (1995). Why do people fail to maintain weight loss? In D.B. Allison (Ed.) Obesity treatment (pp. 97-101).

Ruderman, A.J. & Christensen, H.C. (1983). Restraint theory and its applicability to overweight individuals. Journal of Abnormal Psychology, 8, 235-242.

Schacter, S., Goldman, R., & Gordon, A. (1968). Effects of fear, food deprivation, and obesity on eating. Journal of Personality and Social Psychology, 10, 91-97.

Schlundt, D.G., Taylor, D., Hill, J.O., Shrocco, T., Pope-Cordle, J., Kasser, T., & Arnold, D. (1991). A behavioral taxonomy of obese female patients in a weight-loss program. American Journal of Clinical Nutrition, 53, 1151-1158.

Schlundt, D.G., & Zimering, R.T. (1988). The Dieter's Inventory of Eating Temptations: A measure of weight control competence. Addictive Behaviors, 13, 151-164.

Slochower, J., Kaplan, S., & Mann, L. (1981). The effects of life stress and weight on mood and eating. Appetite, 2, 115-125.

Sobal, J. (1995). Social aspects of obesity. In S. Dalton (Ed.), Overweight and weight management: The health professional's guide to understanding and practice. New York: Aspen.

Stunkard, A.J. (1993). Introduction and overview. In A.J. Stunkard & T.A. Wadden (Eds.) Obesity: Theory and therapy. New York: Raven Press.

Stunkard, A.J., Foch, T.T., & Hrubec, Z. (1986). A twin study of human obesity. Journal of the American Medical Association, 256, 51-54.

VanItallie, T.B. (1979). Obesity: Adverse effects on health and longevity. American Journal of Clinical Nutrition, 32, 23-27.

VanItallie, T.B. (1985). Health implications of overweight and obesity in the United States. Annals of Internal Medicine, 103, 938-988.

Van Strien, T., Rookus, M.A., Bergers, G.P.A., Frijters, J.E.R., & Defares, P.B. (1986). Life events, emotional eating and change in body mass index. International Journal of Obesity, 10, 29-35.

Venditti, E.M., Wing, R.R., Jakicic, J.M., Butler, B.A., & Marcus, M.D. (1996). Weight cycling, psychological health, and binge eating in obese women. Journal of Consulting and Clinical Psychology, 64(2), 400-405.

Wadden, T.A., Bartlett, S., Letizia, K.A., Foster, G.D., Stunkard, A.J., Conill, A. (1992). Relationship of dieting history to resting metabolic rate, body composition, eating behavior, and subsequent weight loss. American Journal of Clinical Nutrition, 56, 2035-2085.

Wadden, T.A., Stunkard, A.J., & Liebschultz, J. (1988). Three-year follow-up of the treatment of obesity by very low calorie diet, behavior therapy, and their combination. Journal of Consulting and Clinical Psychology, 56(6), 925-928.

Wadden, T.A., Vogt, R.A., Foster, G.D., & Anderwon, D.A. (1998). Exercise and the maintenance of weight loss: 1-year follow-up of a controlled clinical trial. Journal of Consulting and Clinical Psychology, 66 (2), 429-433.

Wadden, T.A., & Wingate, B.J. (1995). Compassionate treatment of the obese patient. In K.D. Brownell & C.G. Fairburn (Eds.), Comprehensive textbook of eating disorders. New York: Guilford.

Wilson, G.T. (1985). Psychological prognostic factors in the treatment of obesity. In J. Hirsch & T. Van Itallie (Eds.) Recent advances in obesity research. London: John Libbey & Co.

Wilson, G.T. (1995). Behavioral and psychological predictors of treatment outcome in obesity. In D.B. Allison (Ed.) Obesity treatment (pp. 183-189). New York: Guilford.

Wing, R.R. (1992). Weight cycling in humans: A review of the literature. Annals of Behavioral Medicine, 14, 113-119.

Wing, R.R., Matthews, K.A., Kuller, L.H., Meilahn, E.N., & Plantinga, P. (1991). Waist-to-hip ratio in middle-aged women: Associations with behavioral and psychosocial factors and with changes in cardiovascular risk factors. Arterio Thrombosis, 11, 1250-1257.

Wolfe, B.L. (1992). Long-term maintenance following attainment of goal weight: A preliminary investigation. Addictive Behaviors, 17, 469-478.

Wooley, O.W., Wooley, S.C., Dyrenforth, S.R. (1979). Obesity and women: II. A neglected feminist topic. Women's Studies International Quarterly, 2, 81-92.