
Retrospective Theses and Dissertations

1985

A Comparative Study on Presently and Previously Obese Individuals in Food Diary Records, and Lifestyle Data by Subjects Attending a Weight Control Program

Ileana M. Mancusi
University of Central Florida

Find similar works at: <https://stars.library.ucf.edu/rtd>
University of Central Florida Libraries <http://library.ucf.edu>

This Masters Thesis (Open Access) is brought to you for free and open access by STARS. It has been accepted for inclusion in Retrospective Theses and Dissertations by an authorized administrator of STARS. For more information, please contact STARS@ucf.edu.

STARS Citation

Mancusi, Ileana M., "A Comparative Study on Presently and Previously Obese Individuals in Food Diary Records, and Lifestyle Data by Subjects Attending a Weight Control Program" (1985). *Retrospective Theses and Dissertations*. 4786.
<https://stars.library.ucf.edu/rtd/4786>

**A COMPARATIVE STUDY ON PRESENTLY AND PREVIOUSLY OBESE
INDIVIDUALS IN FOOD DIARY RECORDS,
AND LIFESTYLE DATA
BY SUBJECTS ATTENDING A WEIGHT CONTROL PROGRAM**

BY

**ILEANA M. MANCUSI
B. A., University of Central Florida, 1980**

THESIS

**Submitted in partial fulfillment of the requirements
for the Master of Science degree in Clinical Psychology
in the Graduate Studies Program
of the College of Arts and Sciences
University of Central Florida
Orlando, Florida**

**Fall Term
1985**

ABSTRACT

In an attempt to replicate and extend previous research on the validity of food diary records, 18 obese and 16 previously obese individuals from the community were quizzed on food recording and kcalorie estimation in a controlled analogue of self-monitoring.

Results of the experimental phase of the study replicate those of previous studies indicating that the food diaries of obese clients are invalid because of poor food descriptions, incorrect quantity estimates, and errors in converting kcalories. The results also indicate that subjects tend to overestimate quantities and kcalories of foods.

However, the present study extended previous research by examining the differences between obese and previously obese individuals. It was thought that weight differences might be a function, to some degree, of the person's accuracy at food recording, quantity of portion and kcalorie estimation. The present results suggested no relationship between current weight and accuracy. The implications of this finding suggests that success at weight loss may not be significantly related to an individuals ability at food description, quantity of portion and ability in kcalorie estimation, as was suggested by previous studies. The results of this study strongly question the validity of self reports in food consumption. Its implications in research and practice were examined.

The assessment phase of the study obtained information via a questionnaire on 177 individuals involved in a weight control program. The areas in the questionnaire consisted of: (a) general information, (b) health, (c) environment, (d) emotional aspects of eating, (e) exercise. The findings support past research on obesity, and revealed some areas of interest for future research.

ACKNOWLEDGEMENTS

I am grateful to the committee members, Dr. John M. McGuire, Dr. Richard D. Tucker, and Connie Schneider R. D. for their support, participation, and contribution in the development of this thesis.

Dr. McGuire has been a special source of unconditional support and encouragement since the time I began the graduate program, for which I am very grateful. I would like to give special thanks to Connie Schneider. Connie taught me many things about nutrition, and she was a source of motivation, and encouragement.

I am also grateful to Mr. Charles F. Carmen, Area Director and Vice President of Weight Watchers of Central Florida, for his invaluable help and assistance in recruiting volunteers for the study. And my heartiest thanks to all the counselors, and staff at Weight Watchers for their kind assistance.

I would like to give a very special thank you to my husband, Mr. Joseph F. Mancusi, for understanding how important it was for me to obtain this degree, and for his love, assistance, and commitment along with mine, during the past years. To my parents, and dear sister, I am thankful for their cheery disposition, support, and continuous reinforcement.

TABLE OF CONTENTS

LIST OF TABLES.....	vi
LIST OF FIGURES.....	vii
INTRODUCTION.....	1
Statement of the Problem.....	1
Purpose of the Study.....	4
Definition of Obesity.....	6
Incidence of Obesity.....	8
Health Risks Related to Obesity.....	10
Causes of Obesity.....	12
Theories of Food Intake Regulation.....	14
Heredity Versus Environment.....	16
Learned Responses to Food.....	16
Eating and Emotional Needs.....	17
Inactivity and its Relationship to Obesity.....	18
Treatment of Obesity.....	20
Behavioral Approaches to Weight Control.....	21
Dietary Treatment of Obesity.....	23
Surgery as a Treatment for Obesity.....	25
METHOD.....	27
Subjects.....	27
Materials.....	28
Procedure.....	29
RESULTS.....	32
Experimental Phase.....	32
Assessment Phase.....	36

DISCUSSION	64
Experimental Phase	64
Limitations	68
Assessment Phase	69
CONCLUSION	79
APPENDICES	81
Appendix A	81
Appendix B	83
Appendix C	89
Appendix D	90
Appendix E	92
Appendix F	97
Appendix G	98
Appendix H	100
REFERENCES	102

LIST OF TABLES

1. Averaged percentage scores for quantity estimation	33
2. Averaged percentage scores for computational errors in estimating calories	34
3. Conversion errors	35

LIST OF FIGURES

1. Marital Status	38
2. Education	39
3. Occupation	40
4. Total Household Income in Thousands of Dollars ..	41
5. Experienced Medical Complications	42
6. Materials Utilized to Aid With Diet	44
7. S's Responses Indicating Whether They Have Ever Had a Problem Controlling Their Weight	46
8. S's Responses as to Stage of Onset of Weight Problem	47
9. Behavioral Eating Characteristics Reported by the S's	48
10. Frequency of food types consumed	50
11. S's Responses as to Feelings They Experience While eating	51
12. S's Responses as to Feelings They Experience After Eating	52
13. S's Responses as to Events or Feelings that Trigger Them to Eat	53

14. S's Increased or Decreased Eating Under Different Conditions	55
15. S's Responses of Feelings that are Likely to Make Them Want to Diet	56
16. S'S Responses as to How Often They Feel Depressed	58
17. S'S Incidence of Suicidal Thought or Attempt	58
18. Eating Habits of Subjects During Time of Depression and Suicide	59
19. S'S Response as to Type of Exercise They Typically Engage in	59
20. Exercise Type and Frequency Reported by Subjects	62
21. S's Responses as to Wether Their Weight Affects Their Desire to or Pleasure Derived From Exercise	62
22. S's Responses as to How Exercise Affects the Way They Feel About Their Body	63

INTRODUCTION

Statement of the Problem

In the United States it has been estimated that at least 30 percent of the population is obese (Krause and Mahan, 1979). Because obesity is detrimental to health, it has become a public health problem. As we become more sedentary with advancing technology and as food continues to be abundant and easily accessible, obesity is likely to continue being a major health problem.

Because a large number of the United States population is overweight, obesity has become a major area of study. Most of these studies have centered on the area of caloric intake and output (known as energy balance) and their contribution to the development and treatment of obesity. However, most information on food intake is based on self-report despite their questionable accuracy. There are two basic methods of dietary assessment, the 24-hour recall and self-monitoring. The 24-hour recall requires that a subject recall all foods eaten during a previous 24-hour period. Several studies have shown that the 24-hour recall provides a relatively accurate assessment of food intake (Gersovitz, Madden, Wright, 1978; Madden, Goodman, Guthrie, 1976; Stunkard and Waxman, 1981).

self-monitoring is another method of dietary assessment , in which a subject is requested to make continuous recording of all foods eaten, their caloric values, and behaviors associated with eating. Although research has been done on the validity of the 24-hour recall, there are limited studies exploring the validity of self-monitoring (Lansky and Brownell, 1982; Gersovitz, Madden, Wright, 1978). Self-monitoring is the backbone of behavioral treatment for obesity. It is used to assess caloric intake and has also been used as a treatment procedure. Accurate measures on both sides of the energy balance equation are necessary to understanding obesity and weight loss. Since most forms of weight control methods employ the information acquired from food diaries, it is clear that as long as there are inadequacies in this area, the role of energy expenditure will remain unclear.

Lansky and Brownell (1982), in a laboratory analogue of self-monitoring and in actual food diaries, found overweight clients to have substantial errors in food reports of food consumption. These errors were derived from the subjects' difficulties estimating quantity and kcalories; the incomplete nature of food diaries; and errors in converting food quantities to actual kcalories. It is difficult to determine, however, if their findings are

typical of obese individuals since a control group of previously obese or nonobese individuals was not sampled.

Zegman (1984), in an analogue study of food recording and calorie estimation by obese persons, also identified the sources of errors as poor food descriptions, inaccurate quantity estimations and computational errors in converting kcalories. However, certain experimental controls, such as the use of a complicated guide book and a college population may have affected the generalizability of the results.

Both studies, in addition, found that their subjects tended to overestimate quantities and kcalories of foods presented suggesting that clients in a weight-control program may be ingesting less food than advised. These errors can have serious consequences, including those for initial and long-term weight loss, nutrition, program compliance and physiological satisfaction.

In addition, the practice of rewarding subjects contingent on reports based on food diaries is questionable since self monitored intake may not reflect actual intake. Lansky and Brownell (1982), suggest that etiological research studying the differences in self monitored intake between obese

and nonobese individuals may have questionable validity as long as there are substantial errors in self-reports of food diaries.

Purpose of the Study

The experimental phase of the study replicates and extends previous research, by Lansky and Brownell (1982), and Zegman (1984), by comparing the validity of food diaries of obese and previously obese individuals on food recording and calorie estimation, in a controlled analogue of self-monitoring.

Using previously obese individuals in the study is important in determining whether weight differences (or weight loss) might be a function, in part, of their abilities in food-recording and calorie estimation. In addition, in an effort to increase generalizability, this study recruited its subjects from the community, and subjects used the guide book, The Complete Calorie Counter, by Elaine Chaback. This book was chosen for its clarity and manageability in use, and because it represents the type of book most accessible to dieters and one with which they are likely to be familiar. Subjects were not be grouped according to weight during each phase of the study, thereby maximizing the controls of the study.

To begin to understand obesity, we have to recognize that it results from the interplay of many factors. There is extensive research indicating

that factors such as environment, social status, age, sex, and psychological state play a role in obesity to some degree. In addition, obesity has been associated with a host of health problems, and more recently, exercise has been found to be integral in weight control (Hamilton and Whitney, 1979; Krause and Mahan, 1979; Kupfer and Coble, 1979; Kannel, 1983; Van Itallie, 1983; Bray, 1983; Kuo, 1983). The above areas are examined in greater detail elsewhere in this study.

Therefore the assessment phase of this study attempts to confirm, via a questionnaire, previous research by examining the responses of individuals involved in a weight control program in the the following areas: (a) general information (e.g., socioeconomic status, sex, age etc.), (b) health, (c) environment, (d) emotional aspects of eating, and (e) exercise.

The purpose of this study is to investigate the following two areas:

1. Do overweight individuals, when compared to previously overweight individuals, make significantly more errors in food description, quantity of portion, calorie estimation and computation?

2. The assessment phase of this study will obtain information from individuals involved in a weight-control program on the following areas: (a) general information (e.g., socioeconomic status, sex, age etc.), (b) health,

(c) environment, (d) emotional aspects of eating, and (e) exercise. Via the results of the questionnaire, this area will attempt to confirm previous research. Implications for future research will be examined.

Definition of Obesity

Obesity is defined as a body weight more than 15 to 25 percent above the desirable weight, or more specifically, a condition of the body in which there is excessive fat. A person who is more than 10 percent above the desirable weight on the tables is considered overweight (Hamilton and Whitney, 1979). Morbid obesity is defined as 100 pounds (45.4kg) above ideal weight (Krause and Mahan, 1979).

Although the different areas constituting overweight have been defined, the problem lies in defining the term "ideal weight." Ideal weight is generally defined in reference to average weight according the height and frame; however, persons vary widely in these areas. Body composition plays an important part in defining obesity. For example, a professional football player may not necessarily be obese because a large percent of the body mass is muscle instead of fat. Obesity, therefore, is not a matter of total weight but rather the ratio of lean body mass or muscle to body fat that is the critical measure (Rogers, Mahoney and Mahoney et al. 1980).

Obesity is typically the result of excess caloric intake over energy output and may result from a combination of increased caloric intake or decreased energy expenditure. Obesity may be classified as exogenous or endogenous. The exogenous type develops through an excessive food intake and low activity level. Endogenous obesity is due to some metabolic or other physiological or psychological disorder (Krause and Mahan, 1979).

Many studies have provided conclusive evidence as to the relationship between obesity and physical activity (Harris and Hallbauer, 1973; Kuo, Conn, and De Felice, 1983; Hamilton and Whitney, 1979). Overweight is more likely to develop in the inactive person for two reasons. First, the inactive person expends fewer kcalories each day. Second, it appears that energy intake and expenditure is balanced by the body only when there is moderate activity. At a point of low activity, there is an increase in food intake and subsequently a gain in body weight (Mayer, 1966).

The commonly accepted reasons for obesity are: (a) emotional, when compulsive eating becomes a compensation for emotional and psychological problems; (b) regulatory, when the brain's appetite control center is not functioning properly; and (c) cultural, when parents, family and friends

overeat and inappropriate feeding habits are learned (Krause and Mahan, 1979; Cooke and Mayer, 1980).

Incidence of Obesity

Overweight or obesity occurs in more than 10 % of school-age children in the United States and in about 15 % of the adults (Hamilton and Whitney, 1979). In the 65 or older age category, a third of the men and half of the women are obese (Hamilton and Whitney, 1979). It has also been found that certain subgroups of the United States population have a markedly higher incidence of obesity than others. These include the lower socioeconomic classes, blacks, Mexican-Americans and American Indians (Hamilton and Whitney, 1979).

Estimates of the total of overweight individuals in the United States vary from 10 to 50 million (Bray, 1983). Using 20% above ideal body weight as an index of obesity, the prevalent data for the United States show that 24% of the women and 14% of men aged 18 to 74 are overweight (Bray, 1983). These percentages indicate that at least 16.3 million American women and 8.5 million American men are significantly overweight (Bray, 1983).

In a study conducted by Silverstone, Gordon, and Stunkard in London (cited in Kline et al., 1976), 72 percent of the lower-class women were found to be overweight, while 49 percent of the middle-class and only 39 percent of the upper-class women were in this category. The same pattern was also observed in New York; however, the incidence of obesity was six times more prevalent among lower-class women than among upper-class women. Social class, however, was not found to be a strong indicator of obesity among men in either country. As with women, the high status group contained the fewest obese (26 percent). However, the highest rate of obesity in men was found among middle-class rather than lower-class men, the prevalence of obesity being 41 percent in the middle-class group to 37 percent in the lower class group (Kline, Coleman and Wick, 1976).

Age has also been found to be a contributing factor to the incidence of obesity for both women and men, with a higher incidence of obesity occurring with increasing age. When the three variables of age, sex, and social class were considered separately with the other two held constant, age showed the highest partial correlation (.26, $p < .001$), followed by social class (.17, $p < 0.002$), and sex (.14, $p < 0.01$) (Kline, Coleman and Wick, 1976).

Health Risks Related to Obesity

One of the major risks of obesity is early death from a host of causes, including heart attacks, strokes and complications of diabetes (Hamilton and Whitney 1979; Krause and Mahan, 1979; Keys and Grande, 1973).

Overweight people also suffer from high levels of blood fat, hypertension, post-surgical complications, coronary heart disease, gynecological irregularities and the toxemia of pregnancy (Hamilton and Whitney, 1979).

Obesity shortens life expectancy. Statistics indicate that only 60 percent of overweight individuals reach the age of 60 when compared to 90 percent of normal weight persons. Only 30 percent of overweight individuals reach the age of 70 compared to 50 percent of slim individuals, and only 10 percent of the obese reach the age of 80 (Krause and Mahan, 1979).

The skeletal system, because of the extra weight it must support, is strained causing arthritis, especially of the knees, hips and lower spine (Hamilton and Whitney, 1979). Abdominal hernias can result as a consequence of the muscles that support the belly giving way (Hamilton and Whitney, 1979). Abnormally fat leg muscles may fail to contract efficiently preventing blood returning from the leg vein to the heart, blood collects in the leg veins, which swell, harden and become varicose (Hamilton and

Whitney, 1979). Gout is also a common problem for the severely obese (Hamilton and Whitney, 1979).

The mortality risk is not linearly related to excess weight. Hamilton and Whitney (1979) report that instead, there is a threshold at which risk is dramatically increased. Being a few pounds above this threshold weight may cause blood pressure, blood glucose, and blood lipids to increase significantly.

Unlike other physical handicaps, however, obesity is reversible and some of its risks can be prevented if corrected in time. Data from insurance companies do not indicate that the mortality rate is higher for the formerly obese than for the never obese (Gastineau, 1972).

There are also social and economic disadvantages related to obesity. For example, a fat person is less sought after for dating or marriage, pays higher insurance premiums, may be discriminated against when applying for a job, has more difficulty finding attractive clothes, and is limited in her/his choice of sports. The fat child and adult are often ridiculed by their peers (Kannel, 1983).

Causes of Obesity

It is understood that obesity is caused by excessive calorie intake relative to output; nevertheless, individuals differ in the kcalories needed to produce obesity. The reasons for this variation are complex and may involve genetic, metabolic, psychological, and environmental causes (Brownell, 1980). Most cases of obesity, however, are the chronic, resistant type involving excessive fat tissue in the absence of obvious genetic or hormonal disorders (Krause and Mahan, 1979). Although factors as to the causes of obesity are not conclusive, some of the major possibilities will be described.

Adipose tissue cellularity is believed to be fundamental to the problem on intractable obesity. In general, the earlier in life obesity is established and the more severe it becomes, the more likely there is to be hypercellularity. Hypercellularity occurs either by increase in adipocyte size or number or both. The adipose cell hypothesis postulates that adipocyte is stimulated in the last trimester of pregnancy, early infancy, or adolescence causing irreversible hypercellular expansion of adipose tissue, thus playing a role in the perpetuation of one form of obesity (Kannel, 1983).

Metabolic causes of obesity are still unclear and little conclusive research has been done in this area. However, one cause of obesity due to

metabolic disorder is inappropriate carbohydrate use, which may lead to increased hunger (Hamilton and Whitney, 1979).

Insulin insensitivity is a metabolic disorder that perpetuates once a person is obese. Once obese, the enlarged fat cells become resistant to insulin, the hormone that promotes glucose uptake into cells and its conversion to fat. The excess glucose remaining in the blood stream stimulates further production of insulin-producing cells of the pancreas to multiply and secrete more insulin, in turn furthering fat storage (Hamilton and Whitney, 1979; Kannel, 1983). Weight loss restores insulin levels to normal.

Obesity has been reported to be associated with a variety of psychological problems (Jordan, 1976 cited in Kannel et al.; Sjöberg and Persson, 1979). However, it is not clear how much is cause and how much is effect. The emotional burden of being fat in a society that admires and reinforces lean and physically fit individuals must be considerable. Unfortunately very few studies have been done in this area.

Nonphysiological factors have also been found to play a role in the occurrence of obesity. For example, it has been suggested that the obese are less able to perceive internal feeding cues and rather respond more readily

to external cues (Hamilton and Whitney, 1979; Kannel, 1983). Culturally determined and socially reinforced attitudes towards food and obesity also play a major role (Kannel, 1983).

Theories of Food Intake Regulation

There are several theories of obesity involving food intake regulation. One theory states that the brain monitors blood glucose concentration and signals a person to eat when glucose levels become too low (Hamilton and Whitney, 1979). In this case an obese individual may be said to have an insensitive monitor. Another theory states that food intake may be regulated by fat cells, which in turn send hormonal signals to the brain indicating fullness (Stricker, Rowland, Saller, and Friedman, 1977). In this case obese individuals may possess too many fat cells. Centers outside the brain (e.g., the stomach), may also initiate feeding behavior (Hamilton and Whitney, 1979).

Hunger is defined as a physiological drive- an instinct. Appetite, on the other hand, is psychological, a learned response to food. From a behavioral point of view, obese individuals may have been reinforced for eating at times other than those to satisfy the hunger drive. It may be that the obese

individual has not learned when to stop, thus continuing to eat even when full (Cabanac, Duclaux, and Spector, 1971).

The Satiety Theory states that the feeding behavior is turned on all the time and that a neural or hormonal switch is supposed to turn it off whenever the physiological needs of the body has been met (Linton, Conley, Kuechenmeister, and McClusky, 1972; Cabanac et al., 1971). The stomach is known to be able to signal to the brain when nutrients have arrived. The Satiety Theory suggests that in the obese person the "set point" is too high or malfunctioning. But the nature of the satiety signal is unknown.

Individuals from different cultures experience satiety with different foods so some learning component may be involved (Hamilton and Whitney, 1979).

The External Cue theory suggests that some obese people respond to external cues rather than to internal cues (i.e., visceral hunger cues) for eating. External factors can be, the time of day, or availability of food, sight and taste of food (Shumaker and Wagner, 1977). For those who respond or are easily tempted by external cues, the current social environment provides abundant cues to promote and even reinforce eating behavior. The accessibility and variety of restaurants, television advertisements, abundance of food in markets, vending machines in office buildings and

even gas stations and 24-hour convenience stores serve as stimulus cues for eating and drinking high caloric foods.

Heredity Versus Environment

Research in this area has been conducted with identical twins raised with different families, where one family is overweight and the other thin. Should heredity (genes) determine fatness then both twins would become equally fat or thin. However, if environment should play a role, then the twins would resemble their respective families. Another method is to study adopted children to see whether they resemble their adoptive or natural family. Studies of both kinds have been reported by Mayer (cited in Hamilton and Whitney, 1979), and indicate that the tendency to obesity is inherited, although the environment does play a role, allowing obesity to develop when the potential is there.

Learned Responses to Food

The environment can affect the individual with the potential to become obese early in life. For example, food-centered families may encourage and even reinforce such behaviors as overeating at mealtimes, rapid eating, excessive snacking, poor nutrition and even eating to satisfy needs other than hunger. Children quickly learn inappropriate eating behaviors which

easily generalize outside the home. For example, overweight children were observed to take more bites of food per interval of time and to chew them less thoroughly than their non-obese peers (Drabman, Hammer, and Jarvie, 1977). Some studies (Fabry, 1976 cited in Hamilton and Whitney; Leveille and Romsos, 1974) report that people who eat small but frequent meals may store less fat than those who eat large meals at irregular times.

Eating and Emotional Needs

Hunger and appetite are reported to be related because both are connected to deep emotions (Hamilton and Whitney, 1979). Feeding behavior is a response not only to hunger or appetite but also to more complex human sensations such as "yearning, craving, addictions and compulsion" (Hamilton, 1979). In our culture, food is used for many purposes other than to satisfy nutritional needs. Business lunches, ceremonies and celebrations, watching television or going to the movies are settings where eating occurs to satisfy needs other than hunger.

Another example is that of eating during emotional arousal, such as eating out of boredom, insecurity, or depression (Simon, 1963; Herman and Polivy, 1975; Polivy and Herman, 1976; Paykel, 1977; Leon and Chamberlain, 1973; Leckie and Withers, 1967).

The results of clinical depression investigations showing that individuals who are clinically depressed decrease the amount they eat hold true for non-dieting individuals with depressed mood, but not for dieting individuals (Baucom and Aiken, 1981). Studies conducted by Herman and Polivy (1975), Polivy (1976), and Polivy and Herman (1976), have found that dieters eat more when experiencing depressed mood and nondieters eat less. However, few studies have focused their attention on the relationship between emotional arousal, obesity, and eating, leaving this area unclear (Baucom, Aiken, 1981; Leon, Kolotkin, et al, 1979). Likewise, little attention has been given to the psychological needs and changes of overweight individuals undergoing weight reduction (Loro, 1979).

Inactivity and its Relationship to Obesity

A person may be obese not only because he/she eats too much, but also because he/she expends too little energy. Keys (1973) states that the most important single contributor to the obesity problem in the United States is too little activity. Yudkin (cited in Hamilton and Whitney, 1979) states that the control of hunger/appetite actually works quite well in active people. However, this control fails when the activity falls below a certain minimum level. Obese people under close observation are frequently seen to eat less

than normal weight people (Durnin, Edholm, Miller, and Waterlow, 1974; Adams, Ferguson, Stunkard, Agras, 1978). However, they frequently are so extraordinarily inactive they still have a kcaloric surplus. This is not to say that inactivity is a cause of obesity (Thompson, Jarvie, Lahey, and Cureton, 1982).

An increase in fat, then, reflects an increase in the total amount of stored energy measured as kcalories. Excess fat occurs because there is an imbalance between energy (kcalories) ingested in food and the energy utilized for daily needs. For many people body weight remains within a few pounds over many years suggesting that the body is capable of controlling its storage of energy. This implies that total stored energy or body size may be controlled when given free access to food (Bray, 1983).

The components of energy expenditure by human beings can be divided into three parts: (a) basal metabolism, (b) heat loss due to thermic effects of food, (c) and the energy needs for physical activity (Bray, 1983). Basal metabolic needs are slightly lower for women than for men, but average approximately 1,000 kcal per day. Heat loss due to thermic effects of food are small and not more than 10% of the caloric value of the ingested foods. The energy needed for physical activity then, depends on the type of

activity. Since basal metabolism is not subject to significant changes and thermic effects are small, the only part of energy expenditure that is amenable to significant manipulation is physical activity (Bray, 1983). For example, very light activity, such as the level that occurs during most of the waking time, consumes between 1.5 and 2.0 kcal/min. Light activity increases this from 2.0 to 3.5 kcal/min, whereas moderate activity ranges from 3.5 to 7.0 kcal/min. Expenditure rises above 7.5 kcal/min. only under heavy exertion (Bray, 1983).

Treatment of Obesity

Extensive research has verified that the only realistic and sensible way for the overweight to achieve and maintain ideal body weight is to cut calories, to increase activity and to maintain this lifestyle for the rest of their life. This is a very demanding goal since fewer than a third of those who lose weight manage to keep it off over time (Hamilton and Whitney, 1979). To succeed in weight control means modifying all of the attitudes and behaviors that have contributed to the problem in the first place. The weight control procedure most highly recommended is one that includes dieting, exercise, and behavior modification.

Behavioral Approaches To Weight Control

Numerous studies have shown that behavior therapy is more effective than a variety of alternate treatments for mild and moderate obesity (Stunkard and Wadden, 1983; Bellack, 1975; Jeffery, Wing, Stunkard, 1978; Penick, Filion, Fox and Stunkard, 1971). However, prediction of the outcome of behavioral treatment of obesity has not been very successful and few predictors have been discovered (Stunkard and Wadden, 1983; Mahoney, 1974).

The five essential components of a behavioral program are: "(a) Self-monitoring description of the behavior to be controlled; (b) control of the stimuli that precede eating; (c) development of techniques that control the act of eating; (d) reinforcement of the prescribed behaviors; (e) cognitive restructuring" (Stunkard and Wadden, 1983 p. 124).

(a) **Self-Monitoring.** Clients are requested to keep careful food diaries of what they eat. In addition, they are requested to write each time they eat, precisely what it was, quantity consumed, at what time of the day, where they were, who was with them, and their feelings. Self-monitoring is an essential component of the behavioral assessment of obesity. Through self-monitoring, clients become aware of their eating patterns and the varied circumstances under which they eat.

(b) Control of the stimuli that precede eating. Traditionally, behavioral analysis studies the antecedent events to the behavior to be controlled. Stimulus control of eating may include such techniques as limiting the amount of high caloric foods kept in the house, confining all eating, including snacking to one place, and using distinctive table settings.

(c) Development of techniques to control the act of eating. These techniques are utilized to help clients decrease their speed of eating, become aware of all the components of the eating process, and gain some control over these components. Exercises include counting each mouthful of food eaten, and practicing putting down the utensil between each mouthful. Clients are also encouraged to stop pairing their eating with other activities, such as reading or watching television.

(d) Reinforcement of the prescribed behaviors. In addition to the incidental rewards from the weight program itself and from losing weight, a system of formal rewards is also used. This system can consist of points earned for specific goals met and for achieving weight loss. These points, which serve to provide immediate reinforcement of a behavior, are cumulated and converted into more tangible, personal rewards. A successful reinforcement system rewards clients immediately for specific behavior and for each progress made towards achieving the final goal.

(e) **Cognitive restructuring.** There is limited experimental evidence as to the effectiveness of cognitive strategies in the treatment of obesity. However, studies in this area indicate that it may be a useful contribution to an overall program of treatment for obesity. For example, Mahoney and Mahoney (1976) have drawn attention to the critical role that cognitions and private monologues may play in the maintenance and control of obesity. Cognitive strategies are applied to weight control by allowing clients to discover their most common negative monologues, or self statements, and to estimate their frequency (Stunkard and Wadden, 1983). Then clients are taught arguments against these monologues (Beck, 1976). Repeating the counterarguments over a period of time improves morale, as it has been shown to be effective in the case of depression, and would be beneficial in weight-reducing behaviors (Stunkard and Wadden, 1983).

Dietary Treatment of Obesity

Regardless of the type or cause of obesity, the overweight individual must restrict food intake (Krause and Mahan, 1979). The safest way possible for an individual to lose weight is to adopt a regimen that is adequate in the essential nutrients.

Fad diets such as low-carbohydrate, high-protein, and formula diets come into vogue periodically. Although these diets usually produce rapid weight loss, mainly due to loss of fluid, there is a tendency to regain the weight once the person returns to their normal eating habits (Krause and Mahan, 1979; Hamilton and Whitney, 1979; Williams, 1978).

Bray (1983) identified the following four areas to be considered in the use of diet and nutritional education in treating obesity. These are: (a) selection of the desired degree of caloric restriction in relation to the person's total caloric needs; (b) the distribution of these kcalories between carbohydrate, protein, and fat to provide an adequate amount of all nutrients; (c) the frequency with which the foods are to be eaten; and (d) situations in which food is ingested. After individually assessing daily caloric needs, the next step is to provide a reasonable caloric deficit. "The caloric deficit is the difference between kcalories required to maintain weight and the kcalories in the diet" (Bray, 1983 p. 86). Since the caloric value of body fat is 3500 kcal. per pound, in order to lose one pound a week 500 fewer kcalories must be ingested each day (Krause and Mahan, 1979).

Most diet treatments depend on the client adhering to the recommended daily kcalories via self monitoring of their daily caloric intake. Clients are requested to write down each food they eat and the amount of

that food eaten using weight, volume, or portion size. The caloric value of the various liquids and solids are then referenced from a calorie guide.

Counting kcalories is the primary technique for controlling and monitoring weight loss. However, inaccurate referencing and caloric estimation can have severe consequences in the treatment of obesity. Bray et al. (1978), in a study conducted on the eating patterns of obese individuals, suggested that the estimates of energy intake by the overweight were unreliable. Lansky and Brownell (1982) found the food diaries of obese in treatment to be invalid because of poor food descriptions, incorrect quantity estimates, and errors in converting kcalories.

Surgery as a Treatment for Obesity

Treatment for weight control such as the jejunoileal bypass, gastric bypass surgery, and jaw wiring should be restricted to the morbidly obese person whose health is severely jeopardized by the extreme weight. Blackburn and Miller (1983) state that candidates for surgical treatment should meet at least one of the following criteria: (a) weight at least 300 pounds, (b) weight 100 pounds in excess of ideal body weight, and (c) or weight more than 200% of ideal as determined by the standard weight/height charts. In addition, clients must also demonstrate an inability

to succeed at weight loss with dietary control and should be between the ages of 18 and 50 years. Clients should have an absence of serious heart disease, inflammatory bowel disease, and hepatic or renal dysfunction (Blackburn and Miller, 1983).

METHOD

Subjects

For the assessment phase of the study the subjects consisted of 177 volunteers from the Weight Watchers program. There were 170 females and 7 males, ranging in age from 14 years to 77 years of age (average age: 40). In order to obtain a representative sample (e. g., as to age, socioeconomic status, education etc.), subjects were recruited from 10 different Weight Watchers meetings from around the metropolitan area. The areas consisted of Conway, downtown Orlando, Pine Hills, south-east Orlando, and Altamonte Springs. Subjects were informed that they might be contacted to participate in the second phase of the study, however, all subjects remained blind as to the criteria necessary for participation.

For the experimental phase of the study, 18 obese females 15% or over the upper limit of their ideal body weight range (average +38%), and 16 previously obese females who were currently within +5% to -10% of the upper limit of their ideal body weight range (average -1.5%), were recruited personally following a review of the questionnaires. Obese subjects

averaged 37 years of age (range: 21-64) and 192 pounds (range: 141-235 lbs.). Previously obese subjects averaged 35 years of age (range: 19-74) and 142 pounds (range: 125-160 lbs.). Information on each subject's present weight, height, and age necessary to calculate ideal body weight and percentage overweight, was obtained from the questionnaire.

Materials

Ten vinyl food replicas (Nasco Models WA2987, WA2988 and WA2981) were displayed with corresponding props in order to represent particular food subtypes and preparation methods (e.g., a can of pineapple with syrup was placed adjacent to the replica of pineapple to represent pineapple packed in heavy syrup). A series of pilots previously conducted by Zegman (1984), indicated that the items were recognizable. Nasco determined the quantities of the represented foods.

The paperback book, The Complete Calorie Counter , by Elaine Chaback, was used by the subjects to calculate kcalories. This book was chosen because it contains values for all specific food subtypes and preparations displayed as well as for its clarity and manageability in use. It also represents the type of book most accessible to dieters and one with which they are likely to be familiar, thereby increasing generalizability of the

results. Kcalories for all items were predetermined (see Appendix A). An egg timer was used to time subjects.

Other materials utilized were the weight-control questionnaires, specifically designed for this study, quizzes on food description and kcaloric content, and in addition, individual permission and release forms.

Procedure

The study consisted of two phases, the assessment phase and the experimental phase. During the assessment phase, interested volunteers were recruited from local Weight Watchers meetings to complete a six-page, twenty-three item questionnaire (see Appendix B). Because Weight Watchers clients are requested to come in one hour before the lecture in order to be weighed in, volunteers had ample time to complete and return the questionnaire to the examiner. In addition, subjects were able to record their present accurate weight. All subjects were given a brief detail on the purpose of the questionnaire; they were also informed to read and sign individual release and permission forms (see Appendix C). However, all subjects remained blind as to the hypothesis of the study.

The data from the questionnaires were reviewed to ensure a relatively representative mixture of individuals across age, socioeconomic, and marital

status. Information concerning the subject's current weight, highest weight ever, height, age and sex was obtained via the questionnaire. Following review of these data, utilizing the Weight Watchers' Goal Weight Range, to estimate ideal weight and percentage overweight, subjects were divided into two groups, those 15% or over the upper limit of their ideal body weight range and subjects who were currently within +5% to -10% of the upper limit of their ideal body weight range.

Subjects who qualified for the second phase of the study were contacted and initially recruited by mail (see Appendix D) and later contacted by phone. The letter provided the subjects with a brief description of the study along with a time, date and place to meet. An alternate date was provided for all subjects. As an incentive for participating in the second phase of the study, subjects were informed they would receive a free copy of Elaine Chaback's The Complete Calorie Counter.

For the experimental phase of the study, subjects were instructed to complete 10, four-item quizzes lasting 50 minutes (see Appendix E). All subjects were informed to read and sign individual release and permission forms (see Appendix F). The food items with their appropriate props were displayed in 10 individual sets. Subjects were asked to estimate quantities

using a multiple choice format (food recording measures). Subjects were also asked to reference each of the 10 food items from the calorie guide and estimate kcalories by hand (kcalorie estimate measures). Kcalorie reference responses were used only to determine the accuracy of the subject conversions. Conversions were scored under the assumption that estimated quantities and referenced kcalories were correct. Each subject had five minutes maximum time per set to calculate and record necessary information.

Using a scoring key created for this study, a total of 47 points (100 %) was the criterion for correct food description across the 10 food items (see Appendix G). Subjects were given 2 points for identifying the "critical descriptor" and one point for each additional correct food descriptor.

RESULTS

Experimental Phase

The scores of overweight and previously overweight individuals were analyzed for differences in the areas of quantity of portion, food description, and kcalorie estimation and computation.

Percentage scores (accuracy) for overestimations of quantity of portion averaged 33% for previously overweight and 27% for the overweight group (see Table 1). Percentage scores for underestimations averaged 8% for previously overweight, and 12% for the overweight. Independent t test analysis of quantity estimation data (overestimates, underestimates, accurate estimates) revealed no significant differences between previously overweight and currently overweight individuals; $t(32) = 1.19, p > .05$; $t(32) = -.99, p > .05$; $t(32) = .13, p > .05$.

The percent scores for describing the food item presented to them averaged 41% for the previously overweight, and 40% for the overweight. Independent t test analysis of food description data revealed no significant differences between previously overweight and currently overweight individuals; $t(32) = .32, p > .05$.

TABLE 1
 A VERAGED PERCENT AGE SCORES
 FOR FOOD QUANTITY ESTIMATION

GROUP	OVERESTIMATE	UNDERESTIMATE	CORRECT
Overweight	27%	12%	61%
Previously Overweight	33%	8%	59%

Previously overweight subjects erred in 46% of the kcalorie estimations while overweight subjects erred in 47%. Independent t analysis of correct kcalorie estimation data revealed no significant differences between previously overweight and currently overweight individuals; $t(32) = .54$, $p > .05$. Mathematical errors accounted for 24% and 26% of the conversion errors for the previously overweight and overweight group respectively. Evidence of incorrect measurement equivalents and an inability to handle dilutions resulted in 22% of the conversion errors by the previously overweight, and 21% by the overweight (see Table 2).

TABLE 2
AVERAGED PERCENTAGE SCORES FOR
COMPUTATIONAL ERRORS IN ESTIMATING CALORIES

GROUP	MATH ERROR	INCORRECT MEASUREMENT EQUIVALENTS & DILUTIONS	CORRECT
Previously Overweight	24%	22%	54%
Overweight	26%	21%	53%

Converting quantities and referenced kcalories to final estimates resulted in an average overestimate of 8% by the previously overweight and 2% by the overweight group (see Table 3).

Subjects' scores were also obtained on their ability to find the correct food descriptors in the calorie guide. No significant difference was found between the groups. Both groups averaged 49% equally for finding the correct food descriptors in the calorie guide.

TABLE 3

CONVERSION ERRORS

PREVIOUSLY OVERWEIGHT GROUP

FOOD ITEM	ESTIMATED ^a	CORRECT ^b	DIFFERENCE ^c
1. 1/2 C. corn	109	105.8	3%
2. 3 oz. steak	343	334	9%
3. 1/4 C. cream cheese	94	95	-1%
4. 1/2 C. rice	161	161	0%
5. 2 1/4 slc. pineapple	122	117	4%
6. 1/2 C. tuna	227	160	67%
7. 8 fld. oz. chicken soup	72	71	1%
8. 4 fld. oz. orange juice	66	65	2%
9. 3 oz. drumstick	131	144	-9%
10. 1/2 C. mashed potatoes	<u>108</u>	<u>108</u>	<u>0%</u>
MEAN			8

TABLE 3--CONTINUED

OVERWEIGHT GROUP

FOOD ITEM	ESTIMATED ^a	CORRECT ^b	DIFFERENCE ^c
1. 1/2 C. corn	87.1	87.7	-.1%
2. 3 oz. steak	332	323	3%
3. 1/4 C. cream cheese	86	89	-3%
4. 1/2 C. rice	183	183	0%
5. 2 1/4 slc. pineapple	110.5	111	-.5%
6. 1/2 C. tuna	106	101	5%
7. 8 fld. oz. chicken soup	80	67	19%
8. 4 fld. oz. orange juice	58	55	6%
9. 3 oz. drumstick	123	138	-11%
10. 1/2 C. mashed potatoes	<u>106</u>	<u>107</u>	<u>-1.0%</u>
MEAN			2

a. Subjects' actual kcaloric estimate, means are shown.

b. Correct kcal. determined using the S's quantity estimate and food description chosen from the calorie book. Means are shown.

c. Positive and negative signs indicate overestimates and underestimates.

Assessment Phase

Results of the questionnaire are grouped according to sub-areas.

1) General Information. The average age of the subjects who completed the questionnaire was 40 years; 96% were female. The average weight was

169 pounds and their highest weight ever averaged 189 pounds. Overall, these participants had an average weight loss of 21 pounds.

The majority of the participants (73%), were married (see Figure 1), 36% had some college education with the second highest group (25%), being high-school graduates. Thirty-three percent of the subjects had a college degree or additional graduate or post-graduate education (see Figure 2).

Participants were able to check more than one area when asked how they spend most of their time. Fifty-five percent indicated they keep house, 10% indicated they attend school, 49% work full time, while 13% responded working part-time, 17% checked 'other' and wrote such activities as babysitting and volunteer work (see Figure 3).

Forty-six percent of the participants indicated their total household income was \$35,000 or higher (see Figure 4). The highest percentage 27%, consisted of household earnings between \$35,000-\$49,000 per year. the second highest group 26%, consisted of those earning between \$25,000 and \$34,999 per year.

2) Health. Participants who answered this area were able to check all illnesses that applied to them from 12 specific conditions (see Figure 5). In addition, they were given an opportunity to write other medical conditions

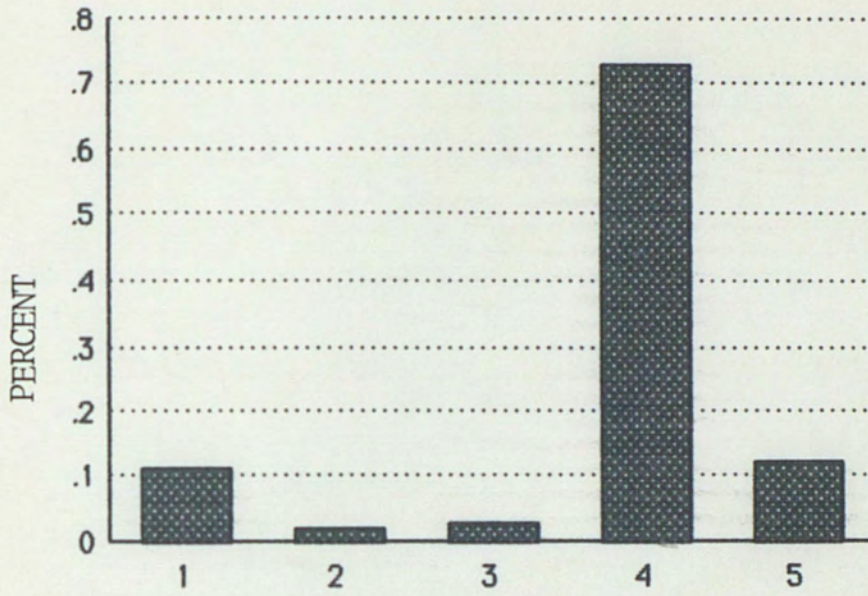


Figure 1. Marital Status

1. single
2. engaged
3. living together
4. married
5. seperated/divorced/ widowed

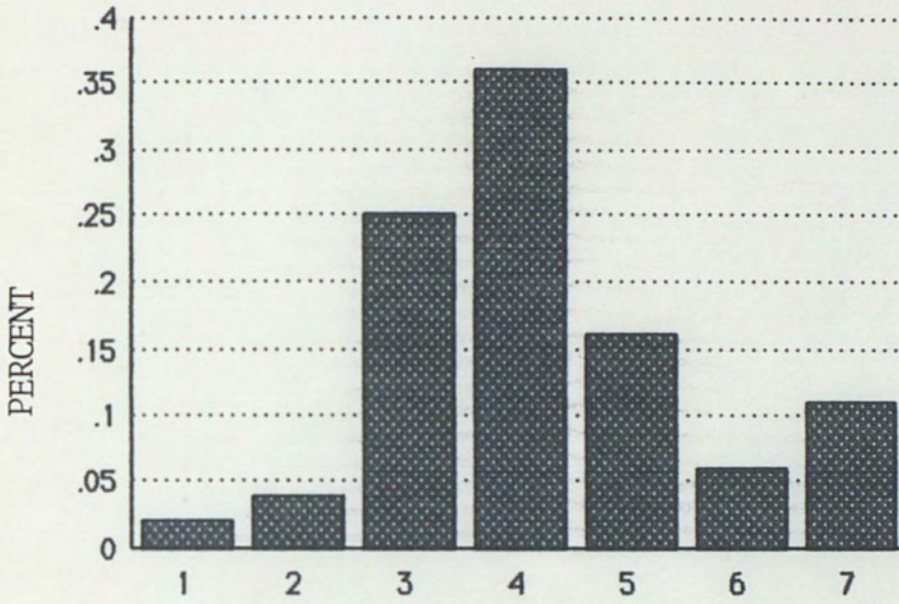


Figure 2. Education

- | | |
|-------------------------|----------------------------------|
| 1. grade school | 5. college graduate |
| 2. some high school | 6. some graduate school |
| 3. high school graduate | 7. graduate/post graduate degree |
| 4. some college | |

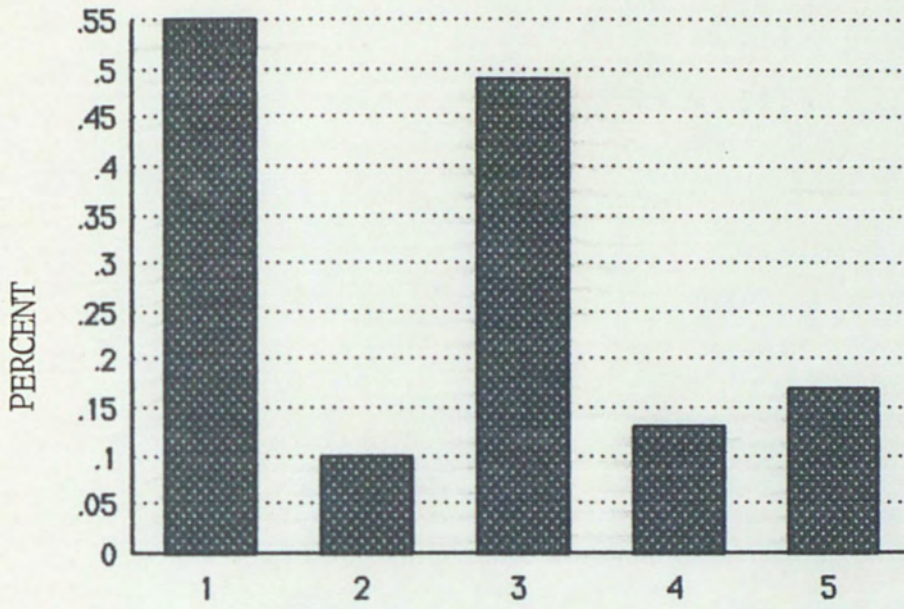


Figure 3. Occupation

- | | |
|-------------------|-------------------|
| 1. housewife | 4. work part time |
| 2. student | 5. other |
| 3. work full time | |

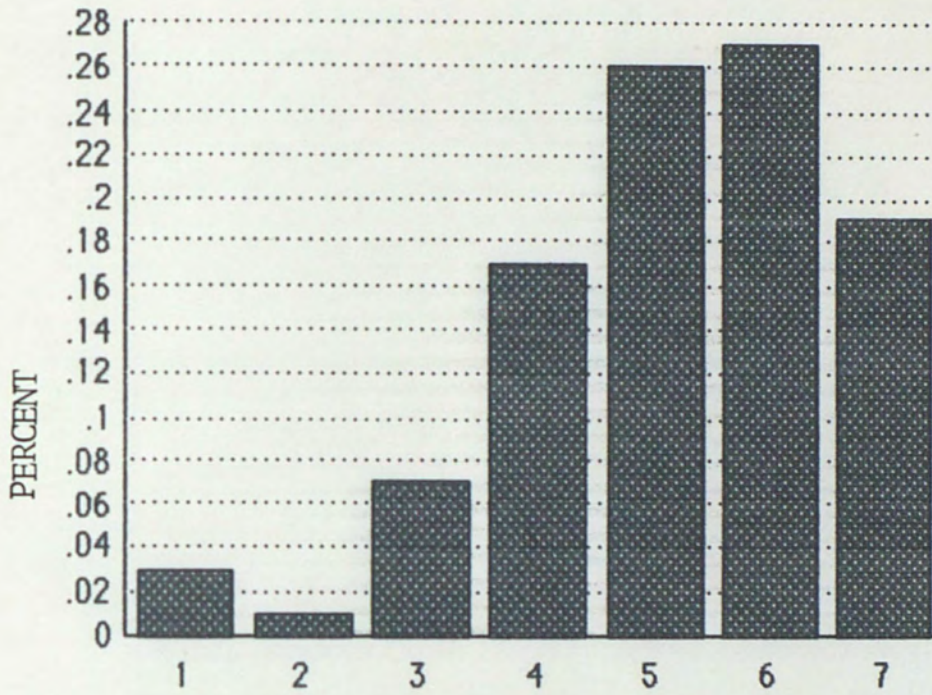


Figure 4. Total Household Income in Thousands of Dollars.

1. under \$7,000
2. \$7,000-\$9,999
3. \$10,000-14,999
4. \$15,000-24,999

5. \$25,000-\$34,999
6. \$35,000-\$49,999
7. \$50,000 and higher

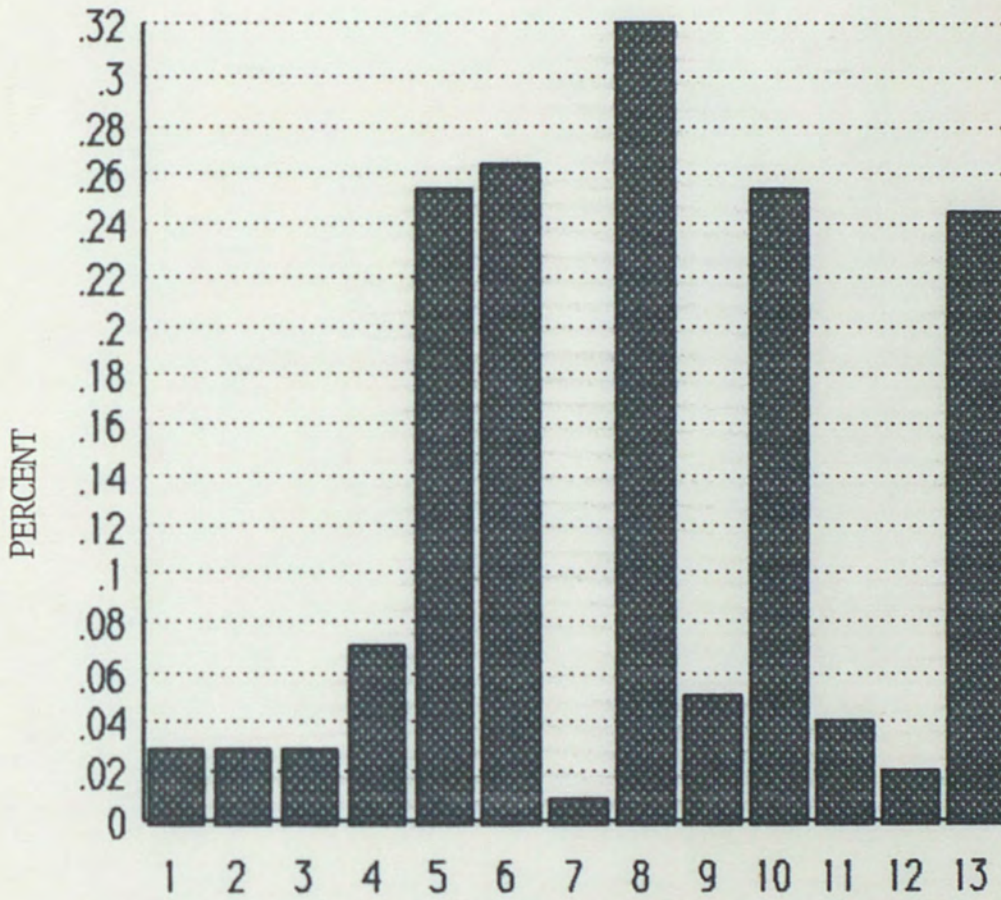


Figure 5. Experienced Medical Complications.

- | | |
|-------------------------|----------------------------------|
| 1. heart attack | 8. hypertension |
| 2. diabetes | 9. post surgical complications |
| 3. cancer | 10. gynecological irregularities |
| 4. toxemia of pregnancy | 11. abdominal hernias |
| 5. arthritis | 12. gout |
| 6. varicose veins | 13. other |
| 7. strokes | |

not indicated in the checklist, which brought the total number of potentially reported medical conditions to 34. Fifty-five percent of all participants who answered this area indicated having experienced or currently experiencing a medical problem. Forty-eight percent of the 98 respondents indicated more than one medical complication. As the figure indicates, the most common reported medical condition was hypertension (32%), followed by varicose veins (27%), and gynecological irregularities (26%).

3) Weight Control. Ninety-four percent of the respondents indicated they were presently on a diet to reduce weight. Ninety-nine percent of the subjects indicated the Weight Watchers program as their present diet treatment. Participants were also questioned as to how successful they thought their present weight control program was. Sixty-seven percent indicated their present weight control program was very successful, 32% considered it moderately successful, and 1% considered it unsuccessful.

Participants were also asked what types of materials they were using to aid them with their diet. Categories were developed according to popularity of responses (see Figure 6). Materials from Weight Watchers (e.g., handouts) ranked highest with 46% of the participants using them to aid with their diet, 27% indicated using a scale, and 26% indicated using the information

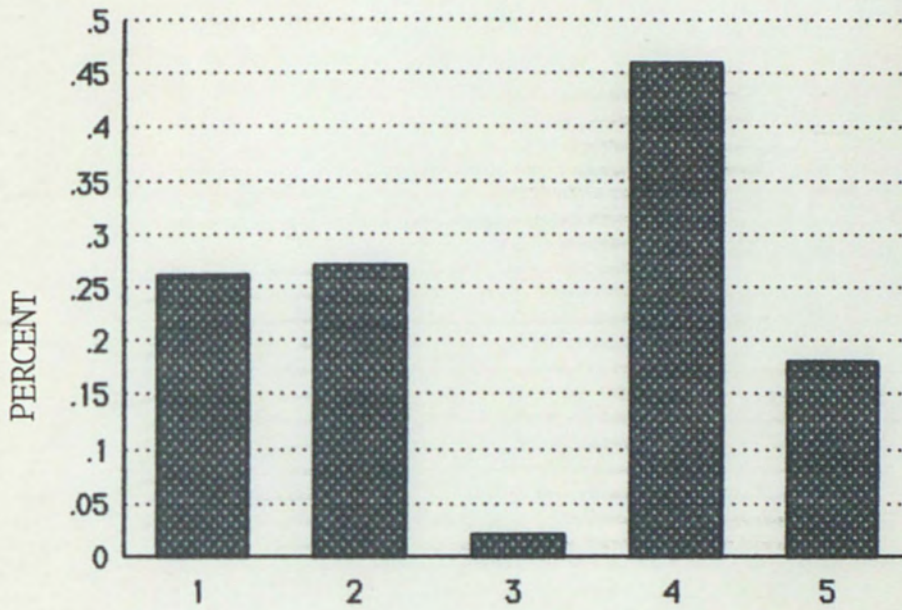


Figure 6. Materials Utilized to Aid with Diet.

1. books/magazines on fitness and health
2. personal scale
3. low calorie foods
4. hand-outs and other material from Weight Watchers
5. other

from books and magazines on health and fitness. Only 2% of the subjects indicated using low kcalorie foods.

Eighty-eight percent of the participants indicated having previously been on other diets to lose weight, and to have been on a diet an average of five times. Participants were asked whether they presently had a problem controlling their weight, 83% revealed a present problem, 14% indicated they used to have a problem , and 3% indicated not ever having a problem (see Figure 7).

When questioned concerning age of onset of their weight problem, 39% indicated adulthood, 30% childhood, 20% adolescence , and 11% gave other reasons such as following surgery or childbirth (see Figure 8).

4) Environment. On the first part of this section participants checked through a list of behaviors and feelings related to inappropriate eating styles (see Figure 9) , and indicated which of four conditions was true for them. Combining the "always" and "often" categories for the top four answers, 67% of the respondents indicated feeling they always/often had to finish everything on the plate, 54% indicated eating rapidly, while 44% checked eating between meals, and 41% eat while watching t.v. Sixty-nine percent of

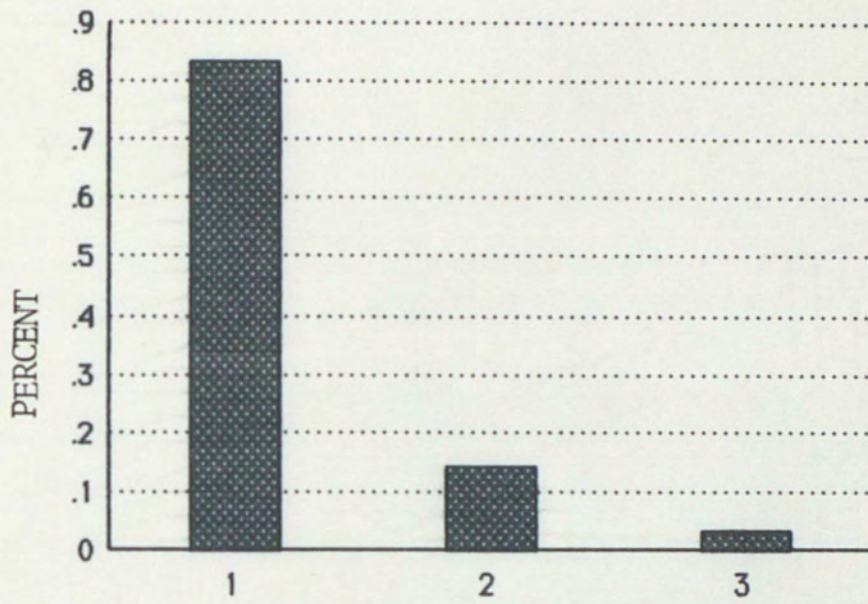


Figure 7. S's Responses Indicating Whether They Have Ever Had a Problem Controlling Their Weight.

1. yes, presently have a problem controlling their weight.
2. used to have a problem controlling their weight.
3. no, never had a problem controlling their weight.

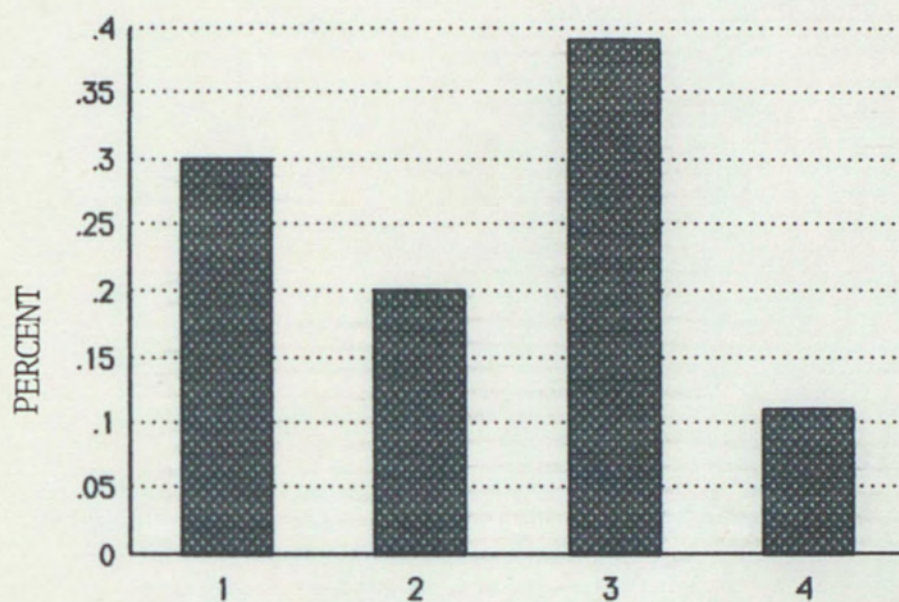


Figure 8. S's Responses as to Stage of Onset of Weight Problem.

- | | |
|----------------|--------------|
| 1. childhood | 3. adulthood |
| 2. adolescence | 4. *other |

* e.g., pregnancy, illness

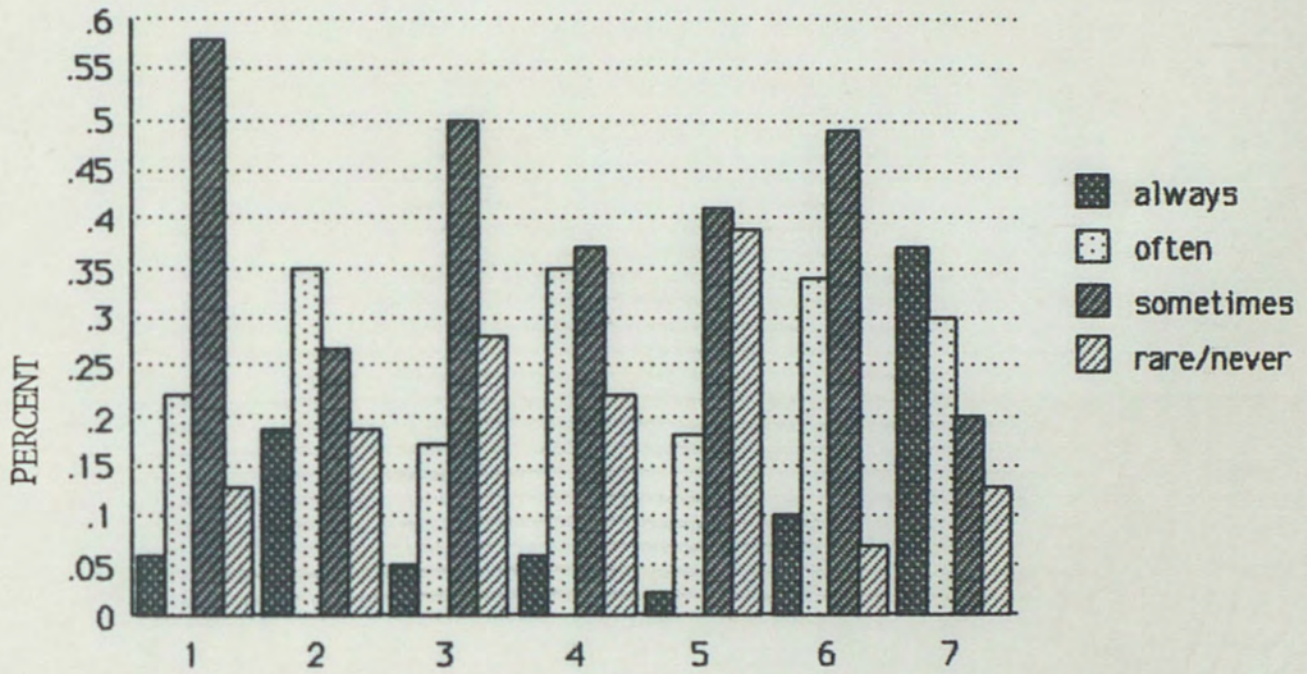


Figure 9. Behavioral Eating Characteristics Reported by the S's.

1. eat a large amount of food
2. eat very rapidly
3. cannot stop/out of control
4. eat while watching television
5. skip meals
6. eating between meals
7. have to finish all on plate

the people indicated one or both of their parents had experienced a weight control problem throughout most of their adult life.

On the last part of this section participants checked the frequency, under four categories, in which they ate specific food items (see Figure 10). Under "frequently", bread/cereal and pasta received the highest percentage (45%), followed by meat/fish/poultry/eggs (40%), while vegetables was 35%, and last was sweets (28%).

5) Emotional aspects. In section one, participants were asked to check which feelings best described how they felt while eating (see Figure 11). The top six responses were: calm (51%), guilty (34%), secure (30%), relieved (23%), stimulated (20%), and excited (18%). The top six responses indicating respondent's feelings after eating were: guilty (49%), calm (37%), disgusted (33%), angry (20%), energized (16%), and relieved (16%) (see Figure 12).

Subjects were also asked which events or feelings triggered them to eat. Responses to this section were reviewed and placed into categories according to popularity (see Figure 13). Boredom was the most frequently indicated event to trigger eating (37%). Loneliness/depression was second highest (29%), followed by anger/frustration (28%), and feeling nervous/anxious (22%).

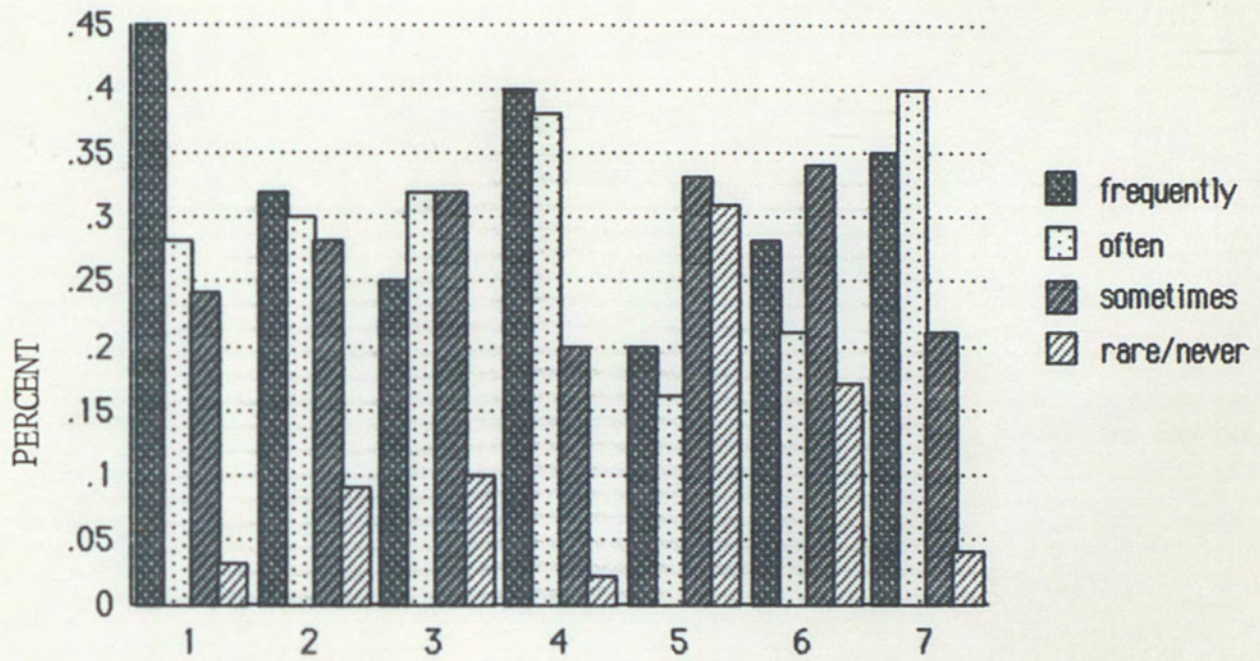


Figure 10. Frequency of Food Types Consumed.

1. bread/cereal/pasta
2. cheese/milk/yogurt
3. fruits
4. meat/fish/poultry
5. salty snack foods
6. sweets
7. vegetables

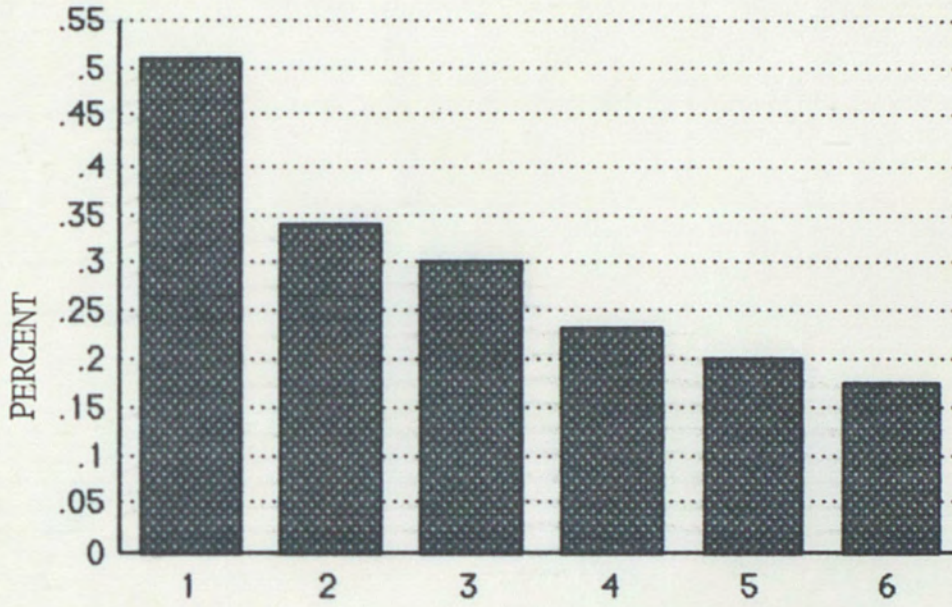


Figure 11. S's Responses as to Feelings They Experience While Eating (highest six responses).

- | | | |
|-------------|---------------|------------|
| 1. calm | 2. guilty | 3. secure |
| 4. relieved | 5. stimulated | 6. excited |

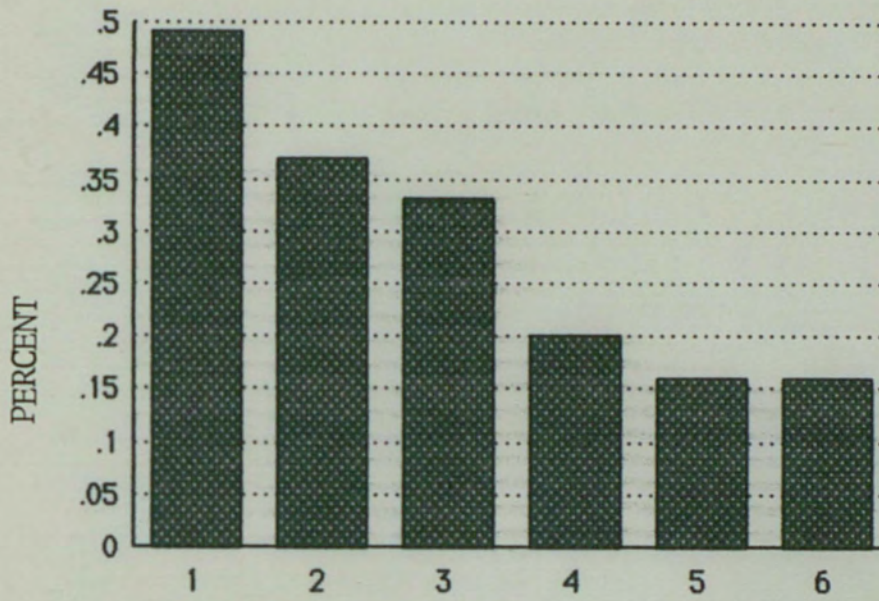


Figure 12. S's Responses as to Feelings They Experience After Eating (highest six responses).

- | | | |
|-----------|--------------|--------------|
| 1. guilty | 2. calm | 3. disgusted |
| 4. angry | 5. energized | 6. relieved |

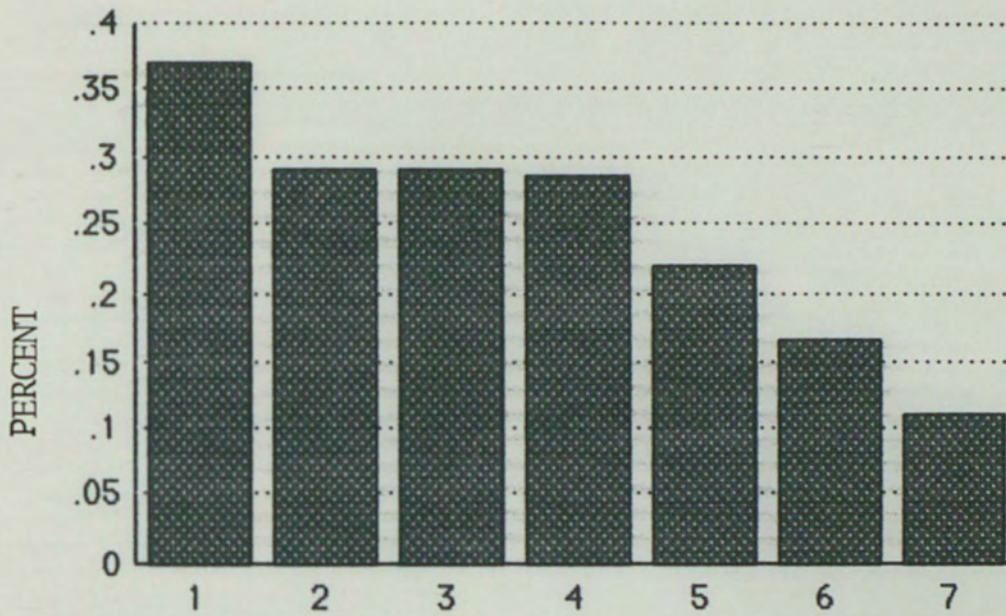


Figure 13. S's Responses as to Events or Feelings that Trigger Them to Eat.

1. boredom
2. lonelines/depressed
3. other
4. anger/frustration
5. nervous/anxious
6. in a hurry/pressed for time
7. social events

On question four of this section, participants were provided fourteen different conditions and were asked whether their eating increased, did not change or decreased under it (see Figure 14). Ninety-three percent of the respondents indicated their eating increased under boredom, for 80% it was while feeling depressed/blue, 78% indicated stress/anxiety, 74% cited loneliness, and feeling fat was the fifth-highest category (58%).

Conversely, 59% of the subjects reported their eating decreased under work. The highest scores for "no change" was cited under conditions of sexual frustration (64%), followed by other daily activities (58%), and happiness (49%).

On question five of this section, participants were asked what feelings were likely to make them want to diet (see Figure 15). Responses were reviewed and placed in categories according to popularity. The top three responses were shame/hate looks (35%), wanting to buy or looking at new clothes (26%) and feeling fat (25%).

The next three questions dealt with the incidence of depression and its relationship to eating. When asked how frequently they felt depressed, 48% responded sometimes, 39% percent indicated rarely, and 13% checked very often (see Figure 16). When subjects were also asked whether they had ever

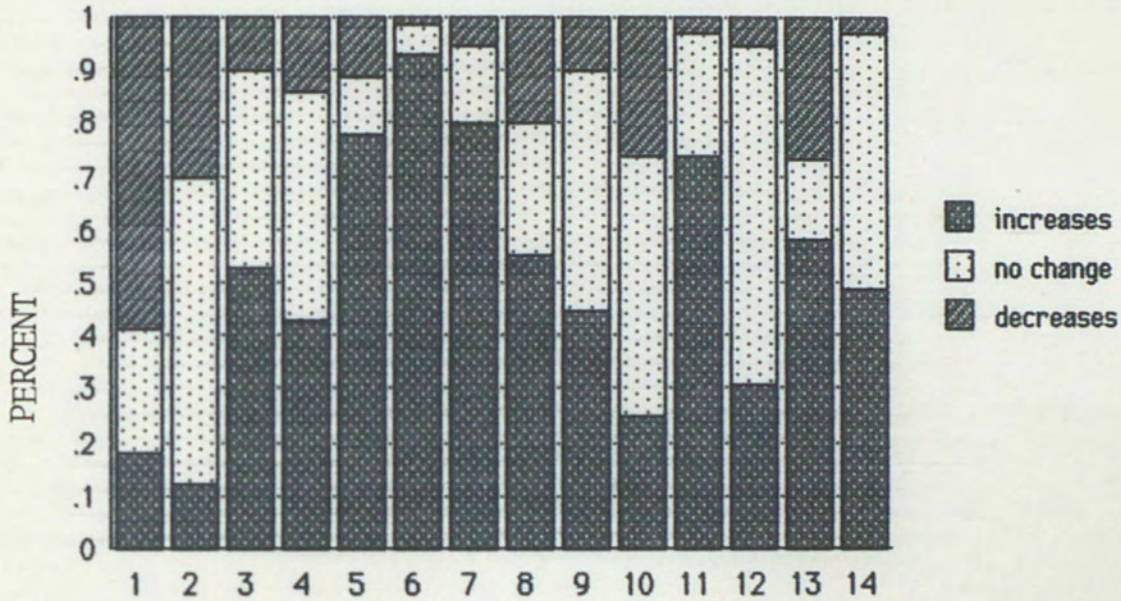


Figure 14. S's Increased or Decreased Eating Under Different Conditions.

- | | |
|---------------------------|------------------------|
| 1. work | 8. anger |
| 2. other daily activities | 9. menstrual cycle |
| 3. feelings about myself | 10. happiness |
| 4. personal relationships | 11. loneliness |
| 5. stress/anxiety | 12. sexual frustration |
| 6. boredom | 13. feeling fat |
| 7. feeling depressed/blue | 14. the time of day |

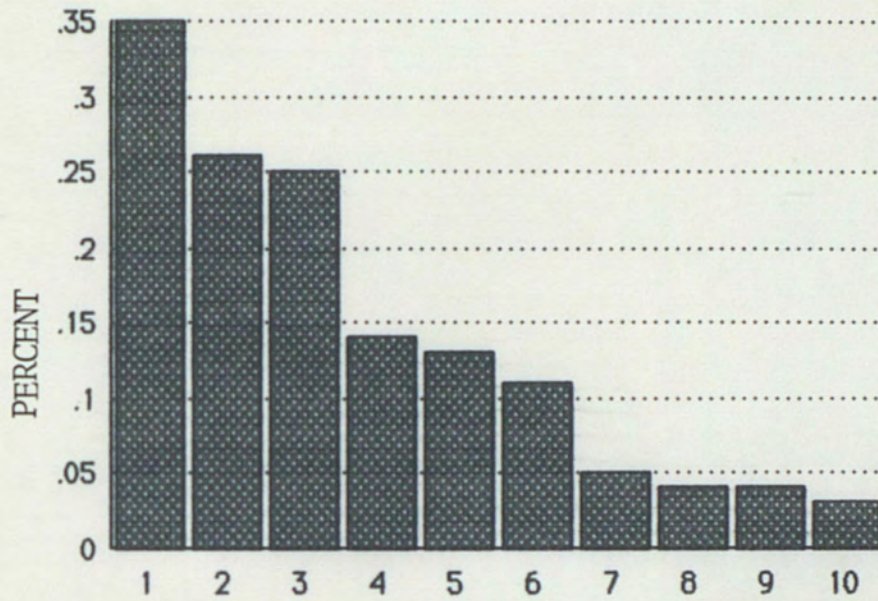


Figure 15. S's Responses of Feelings that
are Likely to Make them Want to Diet.

1. shame/hate looks
2. new clothes
3. feeling fat
4. other
5. feeling happy/loved/ good about self
6. concern over health
7. feeling depressed
8. seeing slim people/ jealous of
9. feeling helpless
10. being physically limited

felt so bad or hopeless that they had thought of suicide, 76% indicated they had not considered suicide, 20% indicated they had thought about it but did not carry it out, and combining the categories for "attempt" and "serious suicide attempt," a total of 3.4% of the respondents indicated having attempted suicide (see Figure 17). Subjects who responded positively to the above questions on depression and suicide, were in turn asked to describe their eating habits and weight during the time (see Figure 18). Forty-nine percent indicated their eating increased, 16 % indicated their eating decreased , and 16% indicated no change.

6) Exercise. The last section of the questionnaire dealt with exercise and fitness, and the respondent's feelings associated with the same. In the first question subjects were asked to list the type of exercise(s) they typically engage in. Responses were reviewed and placed in categories according to popularity; an "other" category was developed for less popular responses (e.g., square dancing) (see Figure 19).

The most popular exercises in descending order were: walking (72%), swimming (21%), aerobics/jazzercise (21%), bicycle riding (15%), jogging (6%), and golf (5%). Subjects were also asked if they engaged in each exercise daily, weekly or monthly (see Figure 20). Walking was the exercise

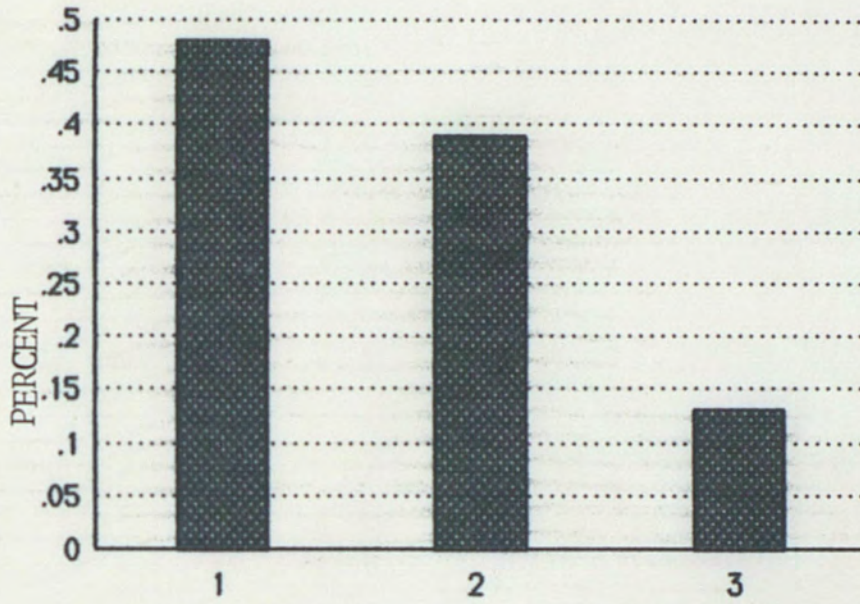


Figure 16. S's Responses as to How Often They Feel Depressed.

1. sometimes 2. rarely 3. very often

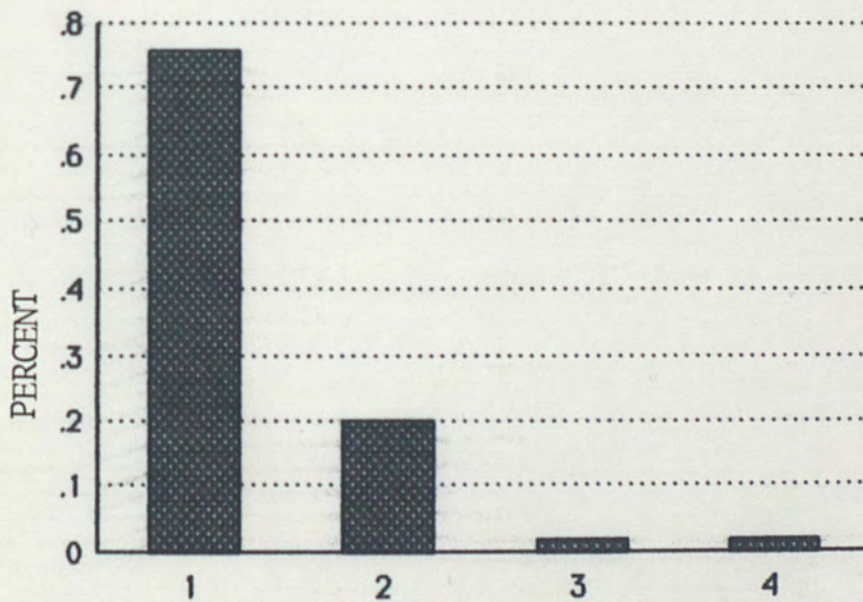


Figure 17. S's Incidence of Suicidal Thought or Attempt.

1. no
 2. yes, thought about it but didn't carry it out
 3. yes, made an attempt
 4. yes, made a serious suicide attempt

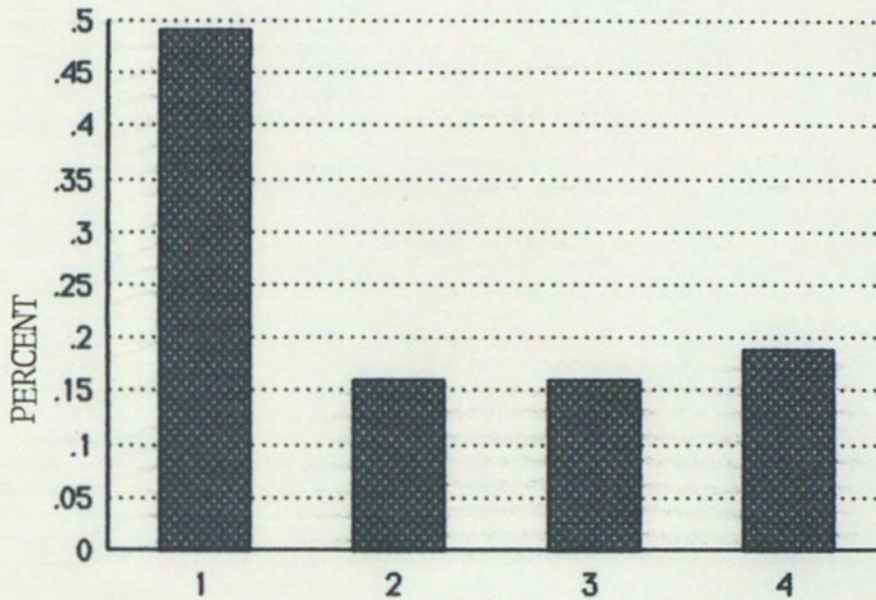


Figure 18. Eating Habit of S's During Time of Depression and/or Suicide.

- | | |
|---------------------|------------------|
| 1. eating increased | 3. no change |
| 2. eating decreased | 4. other changes |

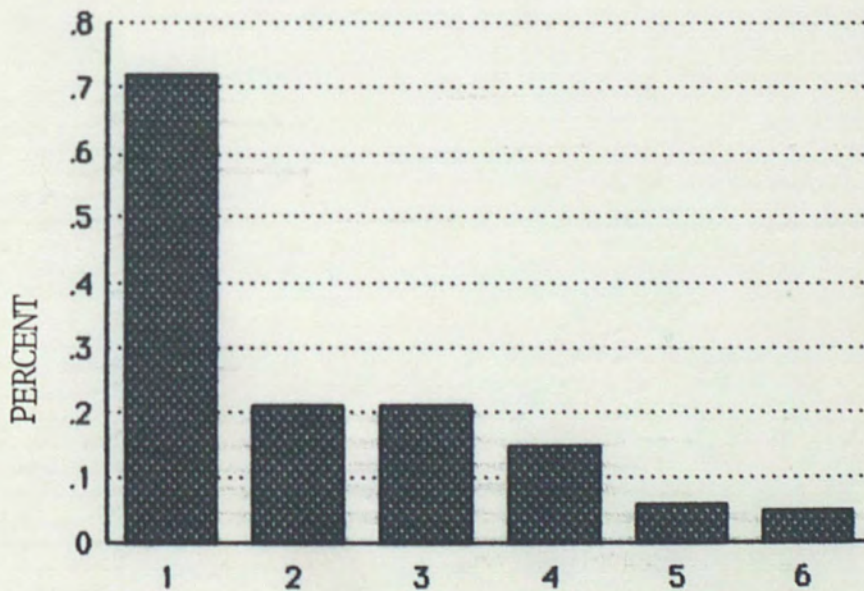


Figure 19. S's Responses as to Type of Exercise They Typically Engage in.

- | | |
|------------------------|-------------------|
| 1. walking | 4. bicycle riding |
| 2. swimming | 5. jogging |
| 3. aerobics/jazzercise | 6. play golf |

which 58% of the respondents engaged in daily, while jogging was the next highest daily activity (44%). Aerobics/jazzercise was performed weekly by 65% of the respondents followed by bicycle riding, (36%). Golf was the only exercise which received the highest score, (71%) for being performed monthly. Subjects engaged in exercise an average of 47 minutes per session.

Participants were asked whether their weight affected their desire to participate in sports/exercise, or the pleasure they derived from them. Forty-three percent indicated "sometimes" their weight affects them, 40% indicated they are "often" affected, and 17% responded that their weight "never" affects their desire to participate or the pleasure they gain from sports (see Figure 21).

The final question asked participants to check, from 10 presented conditions, all that best described how exercise affected the way they felt about their body (see Figure 22). The top four responses indicated that they move more comfortably and feel in better shape (80%), feel more confident and better emotionally (71%), and they feel more in tune with their body (68%). Sixty percent responded they have less desire to eat.

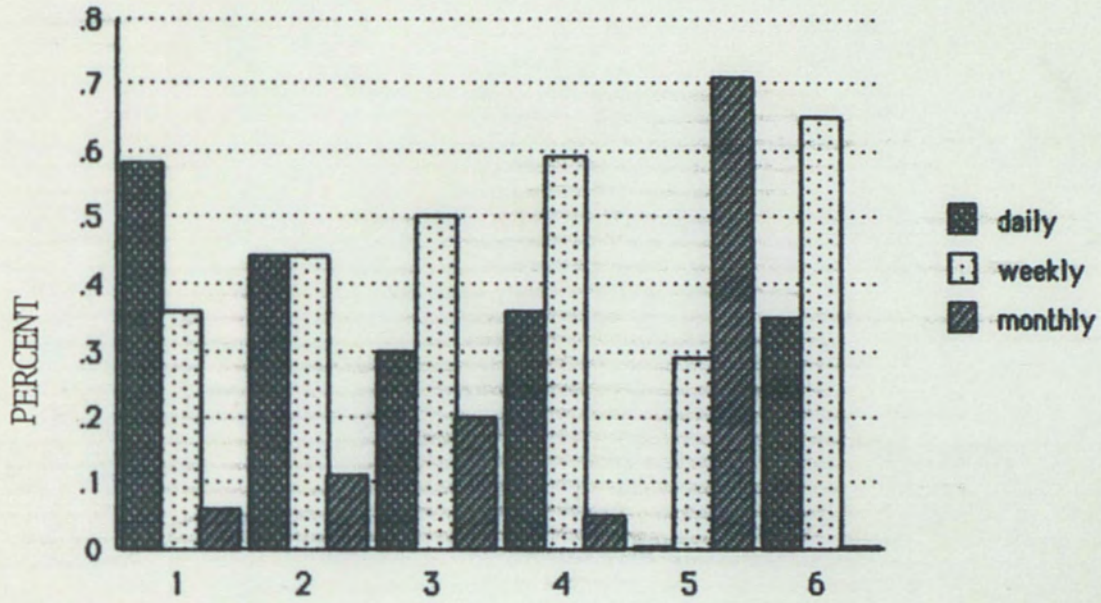


Figure 20. Exercise Type and Frequency Reported by S's.

- | | |
|-------------|------------------------|
| 1. walking | 4. bicycle riding |
| 2. jogging | 5. playing golf |
| 3. swimming | 6. aerobics/jazzercise |

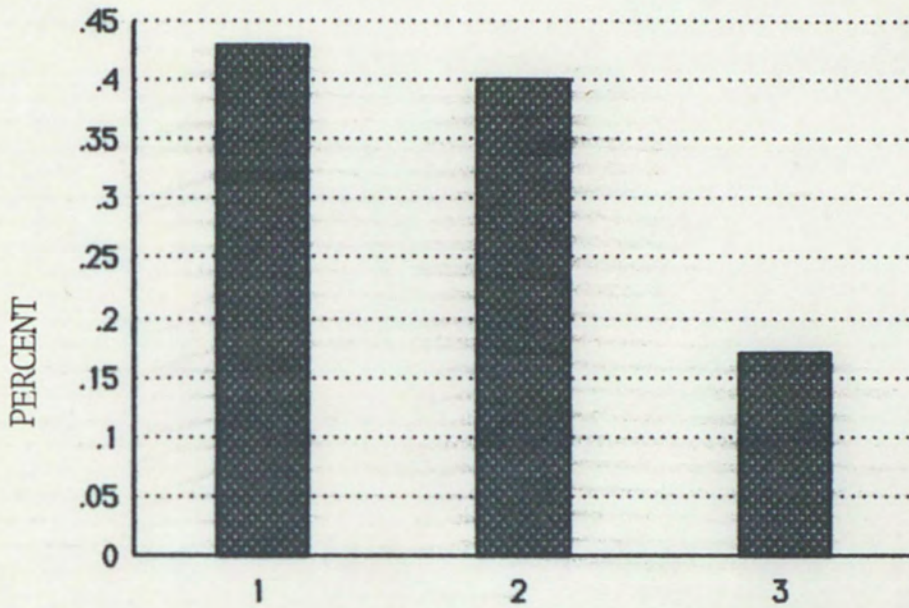


Figure 21. S's Responses as to Whether Their Weight Affects Their Desire to or Pleasure Derived From Exercise.

1. weight sometimes affect pleasure from exercise.
2. pleasure derived from exercise is often affected.
3. weight does not affect pleasure from exercise.

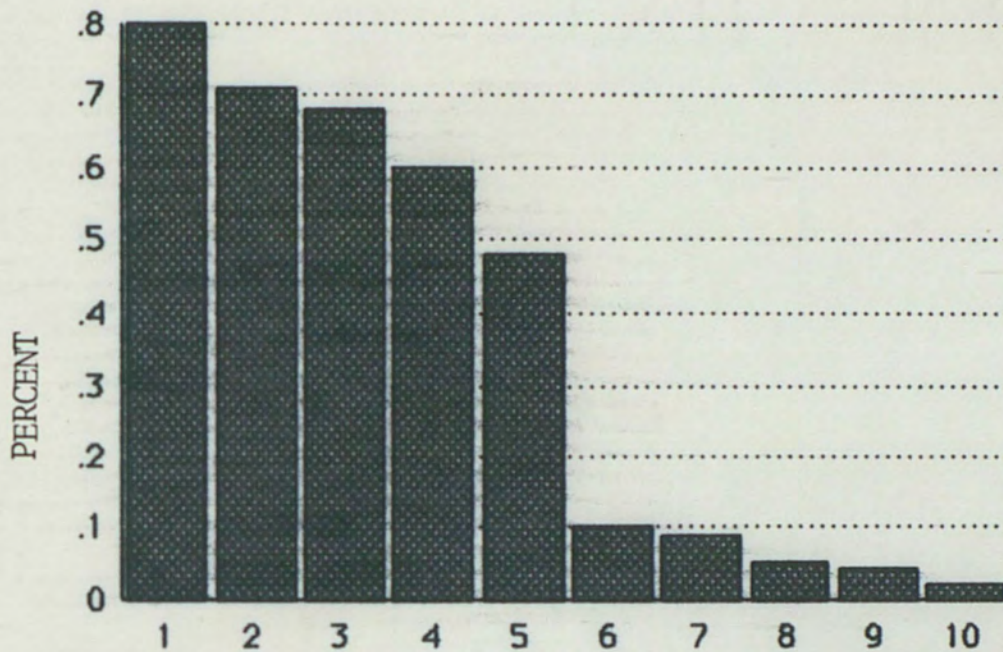


Figure 22. S's Responses as to How Exercise Affects the Way They Feel About Their Body.

1. I move more comfortably and feel in better shape
2. I feel more content and better emotionally
3. I feel more in tune with my body
4. I have less desire to eat
5. I feel less guilty after exercising
6. I feel awkward and clumsy
7. I feel achey and drained
8. I am willing to eat more
9. I feel hungry and tend to overeat
10. I feel depressed

DISCUSSION

Experimental Phase

Results of the experimental phase of the study replicate those of Lansky and Brownell (1982), and Zegman (1984) indicating that the food diaries of obese clients are invalid because of poor food descriptions, incorrect quantity estimates, and errors in converting kcalories. The results also indicate that subjects tended to overestimate quantities and kcalories of foods.

However, the present study extended those of Lansky and Brownell (1982), and Zegman (1984) by studying the differences between obese and previously obese individuals. It was thought that weight differences might be a function, to some degree, of the person's accuracy at food recording, quantity of portion and kcalorie estimation. The present results suggested no relationship between condition (current weight) and accuracy. That is, an inability at food description, quantity of portion, and kcalorie estimation was not found to be particular to currently obese individuals. The implications of these findings suggest that success at weight loss may not be significantly

related to a subject's ability at food description, quantity of portion, and ability in kcalorie estimation, as was suggested by previous studies.

Lansky and Brownell (1982), and Zegman's (1984) findings that obese individuals tend to overestimate quantities and kcalories of foods, suggested that clients following specific kcalorie intake recommendation, might be consuming less than advised because of gross errors. The consequences of these errors presented a possible relationship to the problems in the areas of the initial and long-term weight loss, nutrition, psychological satisfaction, and program compliance. However, the fact that subjects tend to overestimate quantity and kcalories of foods may have less of an effect on the above areas than assumed. The results of this study suggest that subjects successful at weight loss are significantly no more accurate, in the same direction, than their obese counterparts.

Another finding of this study revealed that 49%, of each group, referenced the wrong food item in the kcalorie guide because of inappropriate food description, despite the fact that props were provided that contained necessary information. This finding indicates that even though a subject has estimated the quantity and the kcalorie of a food item correctly, the information would still be invalid if he/she has referenced the information

for the wrong food item. Thus, an emphasis should be placed, when training clients in self-monitoring and kcalorie estimation, in teaching clients to describe food items correctly and referencing the correct food item in the kcalorie guide.

The results of this study strongly question the validity of self reports in food consumption and has implications for both research and practice. The practice of reinforcing subjects contingent on self reports of food intake must be questioned because self-monitored intake may not indicate actual intake. Also etiological studies exploring differences between the obese and non-obese, based on their self-monitored intake, may have questionable validity.

In addition, the practice of using self-monitored food diaries as a tool in weight reduction is questionable. Presently, some weight control programs have understood the complexities in "counting kcalories" and have opted for less complicated techniques. The Weight Watchers program, for example, presently utilizes a reduction program based on the food exchange system (Weight Watchers magazine, June 1985). Briefly, the Exchange System sorts

the foods of the Four Food Groups Plan into exchanges, groupings, that are equal in kcalories with specific serving sizes (see Appendix H), (Hamilton and Whitney, 1979).

The difference in the validity between the 24-hour recall and self-monitoring may be questioned. As was stated earlier in the thesis, the 24-hour recall has been found to provide a relatively accurate assessment of food intake. Conversely, Lansky and Brownell (1982), Zegman (1984), and the results of this study question the validity of self-monitoring. Lansky and Brownell (1982), indicated several reasons for the differing findings between the 24-hour recall and self-monitoring. For instance, the 24-hour recall relies primarily on a person's recollection of the foods consumed, with minimal dependence on the person's skill and motivation in converting observed foods to their actual quantity and kcaloric values. On the other hand, self-monitoring requires considerable degree of skill and motivation to accurately convert observed foods on a continuing basis to their actual quantity and kcaloric values. Therefore, there is more potential for error in the self-monitoring procedure. However, despite its relative validity, the 24-hour recall provides minimal information when compared to self-monitoring, thus limiting its application as a tool in research and treatment.

Limitations

The experimental phase of the study was conceived of as an analogue of food recording and kcalorie estimation by obese and previously obese individuals. Certain experimental controls may have affected the generalizability of the results, although all efforts possible were taken to enhance external validity. Of one hundred people contacted by mail and later by phone to participate in this section of the study, only thirty four subjects volunteered. Since subjects were members of the Weight Watchers program, attrition to the program may have affected participation in this section of the study. Also, the small number of participants may be attributed to the fact that the location in which this study was being conducted may have been inconvenient for some. For example, working women may have found it difficult to attend. Despite these possible inconveniences, every effort was made to maximize attendance. The quizzes were carried out at the Weight Watchers building in downtown Orlando. This location was chosen because of its centrality, easy access and free parking facility. Also, it was thought women would feel safer going to a familiar place. Women were offered an alternate date and were called to verify that the dates and times were convenient to them. Working women

were able to attend before or after work. Subjects were also notified they would receive a free kcalorie counting book as an incentive for their participation.

The use of food replicas may be questioned because of the possible unrealistic appearance of the food. However, this problem was circumvented by the use of realistic props, including containers and labels. Together with the food, the props standardized the appearance of the food, thus strengthening experimental control. This may have been difficult to accomplish with real perishable foods.

Assessment Phase

The assessment phase of this study obtained information from individuals involved in a weight control program. The areas in the questionnaire consisted of (a) general information (e.g., socioeconomic status, sex, age etc.), (b) health, (c) environment, (d) emotional aspects of eating, and (e) exercise. Additional information was also obtained on their weight control efforts and this is reported in the results section of this study. These five areas were developed following a review of past research indicating their relationship to obesity. Although never-obese subjects were

not sampled, the findings nonetheless support past research on obesity , and revealed some areas of interest for future research.

Previous research has indicated a correlation between low socio-economic status and obesity, especially among women. The results of this research indicated that a high percentage of the women work full time (49%) are middle to higher level class (46% have a total yearly income at or above \$35,000), and are relatively well educated (33% had a college degree or graduate or post-graduate education). Although the population sample may be questioned, this problem was circumvented by acquiring subjects from differing socioeconomic levels, from ten different Weight Watchers meetings from around the metropolitan area (refer to Method Section). The results of this study may suggest a shift with an increasing number of weight control problems occurring among the professional middle class to higher-level women. This shift may be due to the increasing number of women who are joining the work force. Although there is more awareness of eating nutritious, lower fat diets, the problem may be compounded by the fact that most professional positions are sedentary. Even women who may not have traditionally experienced a weight control problem may be finding themselves gaining weight once joining the work force. It would be of

interest to study not only the relationship between work and weight control problems among women but, also how the dietary habits of Americans are changing due to the two-income families. Despite society's growing concern with health and fitness, it is ironic that fast food restaurants continue to proliferate. A quick review of the advertisements of fast food restaurants indicates that they are targeting their products to working men and women who have no time to make breakfast, lunch, or dinner.

Past research has indicated a strong association between obesity and numerous health problems, including hypertension, arthritis, diabetes, strokes, varicose veins, and gynecological irregularities. In the area of health, more than half of the respondents in the weight control program indicated experiencing or having experienced a medical complication. The four most popular responses of hypertension, varicose veins, arthritis, and gynecological irregularities for the respondents in this study, support past findings between obesity and health. Unlike other physical handicaps, however, obesity is reversible and some of its risks can be prevented if corrected in time. Intervention studies confirm that levels of blood pressure, serum cholesterol and diabetes can be improved by weight reduction (N.I.H., 1985). More recently, the National Institute of Health (1985), in its report

on the Health Implications of Obesity , indicated that "In view of the excess mortality and morbidity associated with obesity...weight reduction should be recommended to persons with excess body weight of 20% or more above the desirable weight..." (p. 12).

Age and sex have also been found to be contributing factors in obesity with a prevalence of obesity occurring among women, and a higher incidence of obesity occurring with increasing age (Kuo, 1983; Kline 1976). Although both men and women were recruited to complete the questionnaire, ninety-six percent of the participants were women. Nearly forty percent of the respondents indicated their weight control problem commenced during adulthood. The data concerning the sex of the participants should be interpreted with caution. Most of the participants at the Weight Watchers program are women. This may indicate that women may be more aware of or more concerned with losing weight (Zegman, 1983). Other variables may be at work here, for example, men may be more attracted to join a fitness center as a means to controlling their weight. Because most studies on weight control have been done with women, little is known about

overweight men. This is a valid area for future research and the findings may lead to different approaches in weight control methods depending on sex.

Obesity has been reported to be associated with a wide variety of emotional and psychological problems (Jordan, cited in Kannel et al., 1983), unfortunately few studies have been done in this area. In our culture, for example, food is used for many other purposes other than to satisfy nutritional needs. It has been found that people eat out of boredom, insecurity or depression (Simon, 1963; Herman, 1975; Polivy, 1976; Paykel, 1977). This is also supported by this study. Subjects indicated the following conditions not only triggered them to eat, but that the quantity of eating also increased: when feeling bored, lonely/depressed, anger/frustrated, and nervous/anxious. The finding that the respondents' feelings shifted from generally positive while eating, to mainly negative after eating, gives us a clue as to the severity and extent of the relationship between eating and emotions.

The emotional burden of being overweight in a society that reinforces lean and physically fit individuals must be considerable. The fact that subjects responded that shame/hating their looks, wanting new clothes and

feeling fat as the major reasons for wanting to diet, gives us some insight to the effects of these external pressures. In addition, a small number of subjects (3 percent), indicated "never having a problem controlling their weight" despite the fact that they were attending a weight control program. This finding may suggest that some overweight individuals may not see themselves as having a weight control problem, and may be attending a weight control program out of the request of a doctor, friend, or family member or under societal pressure to conform with the present reinforced views of the lean individual.

Another area that has received little attention from researchers is that of obesity and depression. Generally it was thought that one of the effects of depression was decreased appetite. However, the third edition of the Diagnostic and Statistical Manual of Mental Disorders (1981), concedes that under some cases of depression, "Appetite is frequently disturbed, usually with loss of appetite, but occasionally with increased appetite." (p. 210). It is interesting to note that close to fifty percent of the respondents indicated their eating increased when feeling depressed and/or when they had contemplated or attempted suicide.

These findings have implications for further research in the areas of emotions and their relationship to obesity. In addition, although a myriad of weight control facilities are available for the overweight, not enough emphasis has been placed by our society on resolving their psychological and emotional problems. In addition, there is insufficient research examining the personality type (as opposed to the characteristics e.g., sex, age, eating habits etc.) of the obese individual. Perhaps in the future mental health centers will provide group as well as individual therapy specifically designed for the overweight dieter and non-dieter alike.

Some research has indicated that although the tendency to obesity may be inherited, the environment may play a role, allowing obesity to develop when the potential is there (Mayer, cited in Hamilton and Whitney, 1979). For example, some families may encourage and even reinforce such behaviors as overeating at mealtimes, rapid eating, excessive snacking, and poor nutrition. Overweight individuals as children may have learned inappropriate eating behaviors which were generalized outside the home. Sixty-nine percent of the participants in the weight control program who completed the questionnaire, indicated that one or both of their parents had experienced a weight control problem throughout most of their adult life.

Although the majority of respondents indicated first experiencing a weight-control problem during adulthood, it should be noted that the second highest percentage (30%) had a weight control problem since childhood.

The results of the questionnaire also support previous studies by indicating that the most common types of inappropriate eating among the respondents include: a feeling that they have to finish everything on the plate, rapid eating, eating between meals and eating while watching t.v. Behavior modification has been used successfully when treating obesity by teaching new appropriate eating behaviors. However, more emphasis needs to be placed on prevention, by identifying and working with the families of obese children.

The final area of the questionnaire dealt with exercise. It is important to note that individuals may be overweight not only because they eat too much, but also because they expend too little energy. Keys (1973) indicated insufficient activity as being the single most important contributor to obesity in the United States. Over seventy percent of the respondents to the questionnaire indicated walking daily as the most popular form of exercise. When frequency was considered, it is interesting to note that although a small percentage of the respondents jog, they indicated doing so daily. Other

activities such as aerobics, bicycle riding, and swimming were reported to be performed on a weekly basis. Respondents indicated exercising on the average of 47 minutes per session. The Weight Watchers program promotes walking as a form of exercise, which may explain the high percentage, thus limiting the generalizability of the above results to the general population. Another limitation in this area is that subjects who indicated that they exercise weekly were not asked to identify how many times per week they exercised. Clearly, the benefits of exercising increase with frequency. A person who exercises for one hour, once per week, is not going to lose weight or benefit in other ways as much as a person who exercises for thirty minutes, three to four times per week.

An additional benefit from regular exercise is that it provides a feeling of well-being, decreases feelings of depression, provides increased stamina, and decreased appetite (Hamilton and Whitney, 1979; Kuntzleman, 1980; Cooper, 1970). However, involvement in exercise may be affected by the way one feels about his/her weight. Respondents indicated exercise affected them positively. For example, that they move more comfortably and felt in better shape, that they feel more content and better emotionally, and that they have less desire to eat. However, when questioned, forty percent of the

subjects indicated their weight often affected their desire to, or pleasure derived from, exercise. For the obese, any form of exercise may be difficult due to their physical limitations. Exercising may also be difficult for the overweight individual who has had limited experience with it throughout most of their adult life. Exercise should be introduced gradually with tolerance being built over time. Fitness centers and health spas at times deliver the erroneous message that fitness and weight loss can be achieved overnight. The public needs to be more informed of the proper ways to exercise, of its benefits and any risks involved.

CONCLUSION

Obesity is a major health concern for the United States population. Our current knowledge of obesity however, has progressed beyond the simple earlier assumptions that obesity was due to inappropriate eating in the setting of attractive foods. The National Institute of Health (1985), on its report on the Health Implications of Obesity comments that this disease is complex, rooted in biologic systems, and susceptible to psychosocial and cultural factors. An assessment of obesity, as well as the treatment, therefore must be made via the joined efforts of researchers and professionals from varying fields.

The interpretation of available data from differing studies on obesity is at best conflictual. The results of studies have been complicated by the variations in methods of data collection, and followup studies in addition to population samples not representative of the United States population (e.g., college students, pregnant women, the aged). More recently Lansky and Brownell (1982), Zegman (1984), and this study have found the validity of self-monitoring, used in treatment and in analogue studies, to be questionable. At best, it is uncertain as to how far the conclusions of

previous studies can be generalized for recommendations for dietary advice and treatment. Future research methods on obesity and treatment modalities for weight control must use valid tools if we are to increase our understanding of this disease.

APPENDIX A

FOOD ITEM DESCRIPTORS WITH CALORIC CONVERSION LIST

<u>Station</u>	<u>Food</u>	<u>Amount</u>	<u>Page</u>	<u>Food description & listed kcals</u>	<u>Converted Kc.</u>
1.	Corn	1/2 C.	42	vacuum pack, kernels with liquid, 1 C. (174)	87
2.	Steak	3 oz.	13	steak, boneless, lean with fat, raw, 1 lb. (1,597)	299.44
3.	Cottage Ch.	1/4 C.	32	cottage, creamed, large curd, 1C. loosely packed (239).	59.75
4.	Rice	1/2 C.	105	precooked (instant), ready- to-serve (fluffed), 1 cup hot rice (180).	90
5.	Pineapple	2 1/4 sl.	93	in heavy syrup, 1 large slice or 8 chunks and 2 1/4 tbsp. syrup (78).	175.5

<u>Station</u>	<u>Food</u>	<u>Amount</u>	<u>Page</u>	<u>Food description & listed kcal.</u>	<u>Converted Kc.</u>
6.	Tuna	1/2 C.	126	in oil, solid pack or chunk- style, drained, 1 cup (315)	157.5
7.	Ch. Soup	8 fld. oz.	114	chicken vegetable: diluted with equal part water, 1 cup, (76).	76
8.	O. J.	4 fld. oz.	80	orange juice concentrate, frozen: unsweetened, diluted with 3 parts water, 1 C. (112).	56
9.	Drumstick	3 oz.	35	chicken, fresh: fried, 1 drumstick (about 2.0 oz.) (88).	132.0
10.	Mashed Pot.	1/2 C.	99	Potatoes, dehydrated: granules without milk, prepared with water, milk, butter, 1 C. (202).	101

APPENDIX B

Weight Control Questionnaire

(please print all information)

Name: _____ Date: _____

Address: _____

City State Zip

Phone # (home) _____ (work) _____

A. General Information

Age: _____

Sex: female male

Height: _____

Present wt: _____ lbs.

1. Membership Status: (check one) current lifetime new goal

2. At your present height what was the most you ever weighed?
_____ lbs.

3. Are you (check one of the following)

- single engaged living together married
 separated, divorced, widowed.

4. Education: (check highest level completed)

- grade school some high school high school graduate
 some college college graduate some graduate school
 graduate school or other post-graduate degree.

5. Presently, how do you spend most of your time? (check all that apply)

- keep house go to school work full time work part-time
 other _____

6. What is the total household income? (check one)

- | | |
|--|--|
| <input type="checkbox"/> under \$7,000 | <input type="checkbox"/> \$7,000 - \$9,999 |
| <input type="checkbox"/> \$10,000 - \$14,999 | <input type="checkbox"/> \$15,000 - 24,999 |
| <input type="checkbox"/> \$25,000 - \$34,999 | <input type="checkbox"/> \$35,000 - 49,999 |
| <input type="checkbox"/> \$50,000 or more | |

B. Health

1. Have you experienced any of the following medical conditions? (check all that apply).

- | | |
|---|---|
| <input type="checkbox"/> heart attack | <input type="checkbox"/> strokes |
| <input type="checkbox"/> diabetes | <input type="checkbox"/> hypertension |
| <input type="checkbox"/> cancer | <input type="checkbox"/> post surgical complications |
| <input type="checkbox"/> toxemia of pregnancy | <input type="checkbox"/> gynecological irregularities |
| <input type="checkbox"/> arthritis | <input type="checkbox"/> abdominal hernias |
| <input type="checkbox"/> varicose veins | <input type="checkbox"/> gout |

Other: (please explain) _____

C. Weight Control

1. Are you presently on a diet to reduce weight?

- yes no

If yes...

a. How long ago did you start this diet? _____

b. Describe your present diet treatment _____

c. Do you consider your present diet treatment to be?

- very succesful moderately succesful not successful

d. Describe any materials such as calorie counting books etc. that you may be using to aid you with your diet: _____

If not presently on a diet...

- a. Have you ever been on a diet to reduce weight?
 no yes, how many times? _____
- b. Have you ever had a problem controlling your weight?
 yes, now used to no
- c. If you do have a weight control problem but have never been on a reduction therapy or have given up, state the reason why:

2. Since what age have you had a weight control problem?
 childhood adolescence adulthood other (e.g. pregnancy, illness) specify: _____

3. About how many calories do you consume in a typical meal?
 _____ calories

D. Environment

- | | always | often | some-
times | rarely/
never |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Check all that apply: | | | | |
| a. Eat a large amount of food. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Eat very rapidly. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Feel you can't stop or out of control. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d. Eat while watching t.v. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e. Skip meals. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f. Eating between meals. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g. Feel you have to finish everything on the plate. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

2. Has one or both of your parents experienced a weight control problem throughout most of their adult life? yes no

3. Which foods do you have a tendency to eat most often? (Check all that apply).

	frequen- tly	often	some- times	rarely/ never
a. Bread/cereal/pasta	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Cheese/milk/yogurt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Fruit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Meat/fish/poultry/eggs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Salty snack foods	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Sweets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Vegetables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

E. Emotional Aspects

1. What best describes how you feel while eating? (Check all that apply).

- | | | |
|-------------------------------------|--------------------------------------|-----------------------------------|
| <input type="checkbox"/> Calm | <input type="checkbox"/> Angry | <input type="checkbox"/> Secure |
| <input type="checkbox"/> Helpless | <input type="checkbox"/> Spaced- out | <input type="checkbox"/> Panicked |
| <input type="checkbox"/> Stimulated | <input type="checkbox"/> Disgusted | <input type="checkbox"/> Relieved |
| <input type="checkbox"/> Excited | <input type="checkbox"/> Energized | <input type="checkbox"/> Guilty |

2. What best describes how you feel after eating? (Check all that apply).

- | | | |
|-------------------------------------|--------------------------------------|-----------------------------------|
| <input type="checkbox"/> Calm | <input type="checkbox"/> Angry | <input type="checkbox"/> Secure |
| <input type="checkbox"/> Helpless | <input type="checkbox"/> Spaced- out | <input type="checkbox"/> Panicked |
| <input type="checkbox"/> Stimulated | <input type="checkbox"/> Disgusted | <input type="checkbox"/> Relieved |
| <input type="checkbox"/> Excited | <input type="checkbox"/> Energized | <input type="checkbox"/> Guilty |

3. What events or feelings may trigger you to eat? _____

4. Does your eating increase or decrease under the following conditions? (check all that apply).

increases no change decreases

Work.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other daily activities.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feelings about myself.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Personal relationships.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stress/Anxiety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Boredom.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feeling depressed/blue.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Anger.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Menstrual cycle.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Happiness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Loneliness.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sexual frustration.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feeling fat.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The time of day.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. What feelings are likely to make you want to diet?

6. How often do you feel depressed? (check one).

very often sometimes rarely

7. Have you ever felt so bad or hopeless that you thought of suicide?

no yes, made an attempt yes, thought about it but didn't carry it out yes, made a serious suicide attempt.

8. If you answered yes to questions number 6 and 7 above describe your eating habits and weight during that time.

F. Exercise

1. State the type of exercise you typically engage in (e.g., jog, swim, walk, golf etc.).

Type	daily	weekly	monthly
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. How much time do you spend exercising per session?
specify time: _____ hours _____ minutes
3. Does your weight affect your desire to participate in, or the pleasure you derive from sports and exercise?
 often sometimes never
4. Does exercise affect the way you feel about your body? Check all that apply:
- I feel more in tune with my body.
 - I move more comfortably and feel in better shape.
 - I feel more content and better emotionally.
 - I have less desire to eat.
 - I feel less guilty after exercising.
 - I am willing to eat more.
 - I feel awkward and clumsy.
 - I feel achey and drained.
 - I feel depressed.
 - I feel hungry and I tend to overeat.

We sincerely thank you for your completion of this questionnaire.
The information you have provided us with will be instrumental in the continuing research on weight control.

APPENDIX C

INFORMED CONSENT

INFORMATION:

This is a two- part study. The first part of the study requires the completion of a six- page, 23- item questionnaire on weight control. The questionnaire also requests information on the following areas: demographic information, health, emotional aspects of eating, and exercise. The questionnaire should take approximately 20 to 30 minutes to complete.

The second part of the study will be conducted at a later date. Information concerning the second part of the study on weight control, including time and date of meeting, will be provided to you should you be asked to participate.

CONSENT:

I hereby acknowledge that the procedure I will follow is for the purposes of graduate psychology research being conducted by Ileana M. Mancusi. I agree to participate in the study with the understanding that no participant will be identified individually in any report of the research. In addition I understand that I am under no obligation to participate and that I can terminate at any point without any prejudicial pressure bestowed upon me.

Participant's Signature

Date

Experimenter-Witness

Date

APPENDIX D

LETTER REQUESTING VOLUNTEERS

July 5, 1985

Dear Volunteer:

A while ago you completed a questionnaire on weight control during your weekly scheduled Weight Watchers meeting. The response to the questionnaire was excellent, and we sincerely thank you for your participation.

At this point all the questionnaires have been reviewed, and some of the volunteers have been selected to participate in the second part of the study. You are one of the volunteers selected.

For your convenience, the session will be conducted at the Weight Watchers main office at 602 E. Church Street in downtown Orlando. There is free parking available across from the building. You need not be a member of W. W. presently, to participate.

Your participation will consist of completing 10, four question quizzes based on your observations of specific food items displayed in 10 individual sets. The whole session will take approximately 50 minutes.

In appreciation for your participation you will receive a free copy of Elaine Chaback's paperback, The Complete Calorie Counter. It has excellent calorie references to fresh market produce and commercially canned and packaged products.

This session is crucial to the conclusion of the study. Since a specific number of volunteers is needed to complete this session in order for it to be successful, your participation is greatly appreciated.

Please post this sheet in a visible place. Should you have any questions or wish to contact me you can do so at the following number (305) 352-9218 ask for Mrs. Mancusi. I am looking forward to seeing you again!

Thanking You in Advance,

Ileana M. Mancusi

Scheduled date:

Date	Time	Place
------	------	-------

Alternate date:

Date	Time	Place
------	------	-------

APPENDIX E

FOOD ITEM QUIZ

You will find different food items in ten food stations. Your task is to go to each food station and determine the caloric content of the food at that station. A calorie counter food guide is provided to aid you in calculating calories. The props will provide you with further specific information concerning each food item.

Answer all questions about each food. Please write neatly and use a pen, and make no changes once you have answered a question. Do not use the calorie guide until you reach question # 4.

You will be handed a packet with the necessary answering sheets. Be sure to place your name at the top of each answering sheet. Although there are different answering sheets some are appropriate for several food stations. Please make sure that you use the appropriate answering sheet for each station. Use each answering sheet only once. Return the completed 10 sheets to the examiner at the end of the session.

NOTES ON THE GUIDE BOOK-- READ CAREFULLY.

1. The book is divided into two subsections. Be sure to use the first section, using the standard household measures.
2. Please note that the quantities given in the book are units of measure which do not necessarily reflect the quantity represented by the food item before you.
3. On the quiz you will be asked to write down the page in which you found the food item, the food heading and food descriptors. The food heading appears in bold print in the book and is followed by specific food descriptors. Example:
 - a. Page_____12_____
 - b. Food heading_____Beans, red, kidney____
 - c. Food descriptors_____dry, uncooked, 1 cup_____

FOOD ITEM QUIZ

NAME: _____

USED FOR FOOD STATIONS

1, 3, 4, 6, 10

Circled number indicates station used for.

1. Describe the food item before you. _____

2. What is the amount of the food before you? (Circle the correct amount).
a. 1 Cup b. 1/2 Cup c. 1/4 Cup d. 1/8 Cup
3. Where did you locate the item in the guide book? Write down the complete food heading and descriptors you chose, that most resembles the food item before you, exactly as it appears in the book.
 - a. Page _____
 - b. Food heading _____
 - c. Food descriptors _____

4. Based on your quantity estimate in question # 2, and your location of the item on the guide, how many calories are in the food before you. Use the remaining space to calculate your answer.
 - a. _____ calories.

FOOD ITEM QUIZ

NAME: _____

USED FOR FOOD STATIONS

2, 9

Circled number indicates station used for.

1. Describe the food item before you. _____

2. What is the amount of the food before you? (Circle the correct amount).

a. 2 ounces b. 3 ounces c. 4 ounces d. 6 ounces

3. Where did you locate the item in the guide book? Write down the complete food heading and descriptors you chose, that most resembles the food item before you, exactly as it appears in the book.

a. Page _____

b. Food heading _____

c. Food descriptors _____

4. Based on your quantity estimate in question # 2, and your location of the item on the guide, how many calories are in the food before you. Use the remaining space to calculate your answer.

a. _____ calories.

FOOD ITEM QUIZ

NAME: _____

USED FOR FOOD STATION # 5

1. Describe the food item before you. _____

2. What is the amount of the food before you? (Circle the correct amount).
a. 1 1/2 slice b. 2 3/4 slice c. 2 1/4 slice d. 2 1/2 slice
3. Where did you locate the item in the guide book? Write down the complete food heading and descriptors you chose, that most resembles the food item before you, exactly as it appears in the book.
 - a. Page _____
 - b. Food heading _____
 - c. Food descriptors _____

4. Based on your quantity estimate in question # 2, and your location of the item on the guide, how many calories are in the food before you. Use the remaining space to calculate your answer.
 - a. _____ calories.

FOOD ITEM QUIZ

NAME: _____

USED FOR FOOD STATIONS

7, 8

Circled number indicates station used for.

1. Describe the food item before you. _____

2. What is the amount of the food before you? (Circle the correct amount).

a. 3 fld. ounces b. 4 fld. ounces c. 8 fld. ounces d. 9 fld. ounces

3. Where did you locate the item in the guide book? Write down the complete food heading and descriptors you chose, that most resembles the food item before you, exactly as it appears in the book.

a. Page _____

b. Food heading _____

c. Food descriptors _____

4. Based on your quantity estimate in question # 2, and your location of the item on the guide, how many calories are in the food before you. Use the remaining space to calculate your answer.

a. _____ calories.

APPENDIX F

INFORMED CONSENT

INFORMATION:

You will be involved in a study in which you will be required to complete 10, four- item quizzes based on your observations of specific food items displayed in 10 individual sets. On the quiz you will be required to: (a) describe the food item before you, (b) estimate the amount of the food item, (c) reference each of the 10 food items using a calorie guide, and (d) estimate calories by hand. The quizzes will take 50 minutes to complete; you will have five minutes maximum time per set to calculate and record all necessary information.

CONSENT:

I hereby acknowledge that the procedure I will follow is for the purposes of graduate psychology research being conducted by Ileana M. Mancusi. I agree to participate in the study with the understanding that no participant will be identified individually in any report of the research. I understand that I am under no obligation to participate and that I can terminate at any point without any prejudicial pressure bestowed upon me. I may obtain information regarding my own individual performance by requesting it of the experimenter at the conclusion of the study.

Participant's Signature

Date

Experimenter - Witness

Date

APPENDIX G

SCORING SYSTEM FOR QUESTION NUMBER ONE

The three columns below (1,2,3) identify the specific food descriptors and their point value worth. No points will be assigned to food descriptors found in column 1. Two points will be assigned to the "critical" food descriptor as it appears in column 2 and one point will be given to each additional food descriptor found in column 3. Food descriptors not appearing in the columns below will not be scored.

	<u>No Points</u>	<u>2 Points For "Critical" Descriptor</u>	<u>1 Point For Each Additional Descriptor</u>
1.	Corn	kernels	a. vacuum pack, b. with liquid
2.	Steak	raw	a. boneless b. lean c. with fat
3.	Cheese	cottage	a. creamed b. large curd c. loosely packed
4.	Rice	precooked or instant	a. ready-to-serve
5.	Pineapple	in heavy syrup	a. raw b. sliced
6.	Tuna	in oil	a. solid pack or chunk style b. drained

<u>No Points</u>	<u>2 Points For "Critical" Descriptor</u>	<u>1 Point For Each Additional Descriptor</u>
7. Soup	chicken soup or chicken vegetable soup	a. diluted b. from condensed can c. with equal part water
8. juice	orange	a. from concentrate b. frozen c. unsweetened d. diluted with three parts water
9. chicken	fried	a. drumstick or leg b. fresh
10. potatoes	mashed	a. dehydrated b. granules without milk c. prepared with water d. with milk e. with butter

APPENDIX H

DESCRIPTION OF THE FOOD EXCHANGE SYSTEM

Anyone interested in obtaining a complete listing of all the foods in The Food Exchange System is referred to Hamilton and Whitney's book (pp. 31-44); the information may also be acquired from other books on health and nutrition.

The question of what is a nutritious food arises often. Most foods are nutritious in the sense that they provide nutrients, but some foods do not provide nutrients efficiently. The nutrient-density concept allows a distinction between two foods with the same amount of a nutrient but differing amounts of kcalories by saying that the lower kcalorie food is the more nutritious food (Hamilton and Whitney, 1979). The Food Exchange System is useful to the individual who wants to eat nutritiously and control kcalories at the same time.

The Food Exchange System was first developed in 1950 and revised in 1976 by the American Diabetes Association and the American Dietetic Association for use by diabetics. Since then, this system has been used worldwide for diet planning by all types of people.

The Exchange System sorts the foods of the Four Food Group Plan into exchanges, groupings with specific serving sizes that are equal in kcalories. The Exchange System consists of the following food lists: milk, vegetable, fruit, bread, meat and fat. The milk list, for example, separates skim, low-fat, and whole milk and lists the kcalorie values for each. Using the Exchange System, skim milk is considered milk and whole milk is considered milk with added fat. Only low-kcalorie vegetables are found in the vegetable list, so that 1/2 Cup of any of them will provide about 35 kcalories. In the fruit list serving sizes are adjusted so that fruit servings are equal in kcalories. One grapefruit, for example, counts as two fruit exchanges. The meat list separates meats into three categories-lean,

medium-fat, and high-fat. The fat list contains food items where the calories are derived mainly from fat. (Hamilton and Whitney, 1979).

The Four Food Group Plan specifies that a certain quantity of food must be consumed from each group daily. Requirements differ for children, teenagers and pregnant women. For the adult, the number of servings recommended is two servings of meat or meat substitute (2-3 oz. cooked meat, fish, or chicken; 1 C. cooked legumes), two servings of milk and milk products (1 C. milk; 1-2 oz. cheese), four servings of fruits and vegetables (1/2 C. fruit, vegetable, or juice), and four servings of grains (bread, cereal products)(1 slice bread; 1/2 C. cooked cereal; 1C. ready-to-eat cereal) (Hamilton and Whitney, 1979).

When the above information is translated using the Food Exchange System, a person would select 2 milk exchanges from the list, 5 meat exchanges (in the Exchange System one meat exchange is equal to 1 oz.), 2 fruit exchanges, 2 vegetable exchanges, and 4 bread exchanges.

A person on a diet plan using the Food Exchange System, for example, may select 2 servings of skim milk, 5 servings of lean meat, and 3 instead of four exchanges of bread and cereals, in addition to the recommended exchanges for fruits and vegetables. A person wanting to undergo weight reduction should estimate the calories needed to maintain their weight and plan a daily caloric deficit accordingly. Because nutritional adequacy cannot be achieved on fewer than about 1,200 calories per day, a diet based on lower daily caloric intake is not recommended.

REFERENCES

- Adams, N., Ferguson, J., Stunkard, A. J., & Agras, S. (1978). The eating behavior of obese and nonobese women. Behavior Research and Therapy , 16 , 225-232.
- American Psychiatric Association. (1980). Diagnostic and statistical manual of mental disorders , (3rd. ed.). Washington D. C: Author.
- Baucom, D., & 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 , (3) 577-585.
- Beck, A. T. (1976). Cognitive therapy and the emotional disorders. New York: International Universities Press.
- Bellack, A. S. (1975). Behavior therapy for weight reduction. Addictive Behaviors , 1 , 73-82.
- Blackburn, G. L., & Miller, M. M. (1983). Surgical treatment of obesity. In P. T. Kuo, H. L. Conn and E. A. DeFelice (Eds.), Health and Obesity (pp. 149-166). New York: Raven.
- Bray, G. A. (1983). Diet and exercise as treatment for obesity. In P. T. Kuo, H. L. Conn & E. A. DeFelice (Eds.), Health and Obesity (pp. 79-104). New York: Raven.
- Bray, G. A., Zachary, B., Dahms, W., Atkinson, R. L., & Oddie, T. H. (1978). Direct vs. indirect measurements: Eating patterns of massively obese individuals. Journal of The American Dietetic Association , 72 , 24-27.
- Brownell, K. D. & Stunkard, A. J. (1980). Physical activity in the control and development of obesity. In A. J. Stunkard (Ed.), Obesity. Philadelphia: Saunders.

- Cabanac, M., Duclaux, R., & Spector, N. H. (1971). Sensory feedback in regulation of body weight: Is there a ponderostat? Nature, 229, 125-127.
- Cooke, C. J., & Meyers, A., (1980). The role of predictor variables in the behavioral treatment of obesity. Behavioral Assessment, 2, 59-69.
- Cooper, K. H. (1970). The new aerobics. San Antonio, TX: Bantam.
- Drabman, R. S., Hammer, D., & Jarvie, G. J. (1977). Eating rates of elementary school children. Journal of Nutrition Education, 9, 80-82.
- Durnin, J. V. G. A., Edholm, O. G., Miller, D. S., & Waterlow, J. C. (1974). How much food does man require? Nutrition Today, January/February, 28.
- Gastineau, C. F. (1972). Obesity: Risks, causes, & treatment. Medical Clinics of North America, 56, 1021-1028.
- Gersovitz, M., Madden, J. P., & Wright, H. S., (1978). Validity of the 24-hr. dietary recall and seven-day record for group comparisons. Journal of The American Dietetic Association, 73, 48-55.
- Hamilton, E. M., & Whitney, E. (1979). Nutrition: Concepts and controversies. St. Paul, MN: West Publishing.
- Harris, M. B., & Hallbauer, E. S. (1973). Self-directed weight control through eating and exercise. Behavioral Research and Therapy, 11, 523-529.
- Herman, C. P., & Polivy, J. (1975). Anxiety, restraint and eating behavior. Journal of Abnormal Psychology, 84, 666-672.
- Jefrey, R. W., Wing, R. R., & Stunkard, A. J. (1978). Behavioral treatment of obesity: The state of the art 1976. Behavior Therapy, 9, 189-199.

- Kannel, W. B. (1983). Health and obesity: An overview. In P. T. Kuo, H. L. Conn & E. A. DeFelice (Eds.), Health and Obesity (pp. 1-19). New York: Raven.
- Keys, A. & Grande, F. (1973). Body weight and body composition and calorie status. Goodhart and Shils, pp. 1-27.
- Kline, M. V., Coleman, L. L., & Wick, E. E., (1976). Obesity. Springfield, IL: Charles C. Thomas.
- Krause, M., & Mahan, L. K. (1979). Food, nutrition and diet therapy. Philadelphia: W. B. Saunders.
- Kuntzleman, C. T. (1980). Your active way to weight control. Clinton, IA: Author.
- Kuo, P. T. (1983). Metabolic abnormalities of overweight atherosclerotic patients. In P. T. Kuo, H. L. Conn and E. A. DeFelice (Eds.), Health and Obesity (pp. 65-77). New York: Raven.
- Kuo, P. T., Conn Jr., H. L., & DeFelice., E. A. (Eds.). (1983). Health and Obesity. New York: Raven Press.
- Kupfer, D. J., Coble, P. A., & Rubinstein, D. (1979). Changes in weight during treatment for depression. Psychosomatic Medicine, 4, 535-544.
- Lansky, D., & Brownell, K. D. (1982). Estimates of food quantity and calories: Errors in self-report among obese patients. The American Journal of Clinical Nutrition, 35, 727-732.
- Leckie, E. V., & Withers, R. F. J. (1967). Obesity and depression. Journal of Psychosomatic Research, 11, 107-115.
- Leon, G. R., & Chamberlain, K. (1973). Emotional arousal, eating patterns, and body image as differential factors associated with varying success in maintaining a weight loss. Journal of Consulting and Clinical Psychology, 40, 474-480.

- Leon, G. R., Kolotkin, R., & Korgeski, G. (1979). MacAndrew addiction scale and other MMPI characteristics associated with obesity, anorexia, and smoking behavior. Addictive Behaviors , 4 , 401-407.
- Leveille, G. A., & Romsos, D. R. (1974). Meal eating & obesity. Nutrition Today , November/December, 4-9.
- Linton, P. H., Conley, M., Kuechenmeister, C., & McClusky, H. (1972). Satiety and obesity. American Journal of Clinical Nutrition , 25 , 368-370.
- Loro Jr., A. D., Levenkron, J. C., & Fisher Jr., E. B. (1979). Critical clinical issues in the behavior treatment of obesity. Addictive Behaviors , 4 , 383-391.
- Madden, P., Goodman, S. J., & Guthrie, H. A. (1976). Validity of the 24-hr. recall. Journal of the American Dietetic Association , 68 , 143-147.
- Mahoney, M. J. (1974). Self-reward & self-monitoring techniques for weight control. Behavior Therapy , 5 , 48-57.
- Mayer, J. (1966). Why people get hungry. Nutrition Today , 1 , 2.
- Message to our readers. (1985, June). Konner, L. (Ed.) Weight Watchers Magazine , p. 62.
- National Institute of Mental Health. (1985). National Institutes of Health consensus development conference statement: Health implications of obesity. Rockville Pike, MD: Author.
- O' Leary, K. D. (1979). Behavioral Assessment. Behavioral Assessment , 1 , 31-36.
- Paykel, E. S. (1977). Depression and appetite. Journal of Psychosomatic Research , 21 , 401-407.
- Penick, S. B., Filion, R., Fox, S., & Stunkard, A. J. (1971). Behavior modification in the treatment of obesity. Psychosomatic Medicine , 33 , 49-54.

- Polivy, J. (1976). Perception of calories and regulation of intake in restrained and unrestrained subjects. Addictive Behaviors, 1, 237-243.
- Polivy, J., & Herman, C. P. (1976). Clinical depression and weight change: A complex relation. Journal of Abnormal Psychology, 85, 338-340.
- Rogers, T., Mahoney, M. J., Mahoney, B. K., Straw, M. K., & Kenigsberg, M. I. (1980). Clinical assessment of obesity: An empirical evaluation of diverse techniques. Behavioral Assessment, 2, 161-181.
- Schumaker, J. F., & Wagner, M. K. (1977). External cue responsivity as a function of age at onset of obesity. Journal of the American Dietetic Association, 70, 275-279.
- Simon, R. I. (1963). Obesity as a depressive equivalent. Journal of The American Medical Association, 183, 208-210.
- Sjöberg, L., & Persson, L. O. (1979). A Study of attempts by obese patients to regulate eating. Addictive Behavior, 4, 349-359.
- Stricker, E. M., Rowland, N., Saller, C. F., & Friedman, M. I. (1977). Homeostasis during hypoglycemia: Central control of adrenal secretion and peripheral control of feeding. Science, 196, 78-81.
- Stunkard, A. J. & Wadden, T. A. (1983). Behavior therapy and obesity. In P. T. Kuo, H. L. Conn and E. A. DeFelice (Eds.), Health and Obesity (pp. 105-130). New York: Raven.
- Stunkard, A. J., & Waxman, M. (1981). Accuracy of self-reports of food intake. Research, 79, 547-551.
- Thompson, J. K., Jarvie, G. J., Lahey, B. B., & Cureton, K. J. (1982). Exercise and obesity: Etiology, physiology and intervention. Psychological Bulletin, 91, 55-79.

- Van Itallie, T. B. (1983). Some determinants of body fat content. In P. T. Kuo, H. L. Conn and E. A. DeFelice (Eds.), Health and Obesity (pp. 49-63). New York: Raven.
- Williams, S. R. (1978). Essentials of nutrition and diet therapy. St. Louis: C. V. Mosby.
- Zegman, M. A. (1983). Women, weight and health. In V. Franks and E. D. Rothblum (Eds.), The stereotyping of women: Its effect on mental health (pp. 172-200). New York: Springer Publishing.
- Zegman, M. A. (1984). Errors in food recording and calorie estimation: Clinical and theoretical implications for obesity. Addictive Behaviors , 9 , 347-350.