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EFFECTS OF AGE OF ONSET OF OBESITY
ON EFFECTIVENESS, INTEROCEPTIVE AWARENESS,
INTERPERSONAL TRUST, GLOBAL LOCUS OF CONTROL,
AND WEIGHT LOCUS OF CONTROL
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EFFECTS OF AGE OF ONSET OF OBESITY

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ABSTRACT

EFFECTS OF AGE OF ONSET OF OBESITY
ON EFFECTIVENESS, INTEROCEPTIVE AWARENESS,
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GLOBAL LOCUS OF CONTROL, AND
WEIGHT LOCUS OF CONTROL

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The major purpose of this study was to determine
whether personality differences occur among the obese
population as a function of age of onset of the obesity,
when the effect of potentially confounding variables is
controlled. In five separate hierarchical regression
analyses, age of onset was the primary independent variable
for five dependent personality variables: ineffectiveness,
interpersonal distrust, interoceptive awareness, locus of
control, and weight locus of control. The first three
dependent variables were measured by subscales of Garner
and Olmsted's Eating Disorder Inventory. Locus of control
was measured generally with Rotter's Internal-External
Locus of Control Scale, and specifically with Saltzer's
Weight Locus of Control Scale. In addition to age of
onset, eight independent variables were used as predictors
to control for their potentially confounding effects:

Virginia C. Duerst

certainty of age of onset, age, weight stability, percent
overweight, dieting status, sex, education, and income.

Two secondary hypotheses were tested using a
point-biserial analysis to determine (a) whether the
presence of a stressor at onset correlated with age of
onset, and (b) whether the sibling rank of only or youngest
child correlated with age of onset.

Adult volunteers who were 20% or more overweight, with
no history of bulimia or anorexia nervosa, were obtained
from six sources within an urban area in the midwestern
United States.

Age of onset was found to account for a significant
(at the p < .05 level) proportion of the variance in Locus
of Control and Weight Locus of Control, when the effect of
the other independent variables was controlled. Earlier
onset individuals were significantly more external in both
locus of control and weight locus of control than later
onset participants, as predicted. Age of onset accounted
for an insignificant (p > .05) proportion of the
variance in Ineffectiveness, Interoceptive Awareness, and
Interpersonal Distrust. Presence of a stressor at onset
correlated positively and significantly with increasing age
of onset (r = .22, p = .0046), but the relationship between
age of onset and rank among siblings was not significant
(r = -.003, p = .97).

iii

To my husband Tom.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

CHAPTER I

INTRODUCTION

Need for Obesity Research

Obesity is a widespread disorder, one that affects many facets of the lives of those it touches. According to the National Center for Health Statistics (1985) 30% of white adults, ages 35-74, are overweight. For blacks the picture is worse. Fifty-five percent of black females, age 35-74, and 35% of black males are considered overweight. Obesity is more common among lower socioeconomic groups, middle-aged individuals, and black and Hispanic people. Other estimates place the incidence at over one third of our population, when obesity is defined as an excess of 20% of normal body weight (Allon, 1975).

Not only is the prevalence of obesity extensive, but its influence on the lives of those it touches is considerable. Health risks associated with obesity have been a major area of research for medical scientists. Numerous physical consequences and complications have been associated with obesity. They include angina pectoris, appendicitis, arteriosclerosis, arthritis, breathing difficulties, brain hemorrhage, cirrhosis of the liver, congestive heart failure, diabetes, hemorrhage, hypertension, kidney disease, lower back pain, Pickwickian syndrome, reactive polycythemia, surgical complaints, and toxemia during pregnancy (Mahoney and Mahoney, 1976).

1

Perhaps equally painful to the obese individual are cultural attitudes towards overweight and their effects on mental health. Historically, societal attitudes towards obesity have fluctuated with food availability, so that during scarcity, "plumpness" was admired. During present times of food abundance within Western civilizations, social devaluation of the obese is readily evident (Allon, 1975).

Examples of prejudice are ubiquitous, even in places where professional standards usually prevail. News reports, in which ideals of objectivity are endorsed, often reflect societal prejudice. For example, when "Mama Cass" Elliot, a 200 pound rock singer, died, news reporters focused on two pieces of biographical information, her body weight and the cause of death, "choking on a ham sandwich". Much local television coverage was insensitive, including unconcealed ridicule about the cause of death (Wooley & Wooley, 1979).

Nor is the medical profession exempt from such prejudice. Wooley & Wooley (1979) describe an ad printed in a medical journal in which a young doctor shakes his finger at an older overweight woman. She looks down in shame. Similarly, a second ad depicts an overweight woman claiming "But doctor, I eat like a bird," while the physician imagines a vulture. This ad became so popular that it became a frequent opener in professional

presentations.

It is widely recognized that obese individuals are the frequent butt of comic "humor". Joan Rivers, for example, has repeatedly joked about Elizabeth Taylor's obesity. When the ex-beauty ideal lost weight, Rivers took Shelly Winters, another overweight actress, as her target.

Nor are psychologists exempt from the effects of societal attitudes. Sheldon, an early theorist, attempted to describe the personality of endomorphic persons: they are lovers of comfort, relaxed and easy-going (Hall and Lindzey, 1957). This theory is not far removed from the popular "fat, jolly, and lazy" stereotype of obesity.

In this culture, where fat is negatively viewed, there is a corresponding trend towards thinner ideals. In a twenty-year longitudinal study of Playboy centerfolds and Miss America Pageant contestants, Garner, Garfinkel, Schwartz and Thompson (1980) found that average weights have significantly decreased. Among the pageant winners, weights were significantly lower than among the other contestants. Along with this downward trend of beauty standards, actual weights among the population for women under age 30 have increased.

The widening gap between ideal and actual weight provides ripe conditions for the development of low self-esteem and depression. Whether the social devaluation of obese individuals causes depression, or whether

depression causes overeating is controversial. The causal order may vary with the individual, or depression and overeating may interact in a circular manner. Hooker and Convisser (1983) hypothesize that overeating may be a defense against depression or other strong emotions. Similarly, Hilde Bruch (1973) warns physicians against arbitrarily cutting a patient's food intake, because eating may be the least destructive defense in the service of ego functioning.

Even among children, social rejection of the obese is readily apparent. In a study of how children select preferred playmates, Allon (1975) found that obese youngsters were rated last, below minority members and the physically disabled. Consequently, they are teased and ostracized during these formative years. When the time comes to enter college, obese girls have one third the chance of normal-weight girls to be accepted for admission, provided that qualifications are equal and a personal interview is required (Mayer, 1975). Adults have similar prejudices, and like children, they rate obese persons as last among preferred associates. This attitude permeates the employment market, where obese applicants are refused work; Armed Forces discharge overweight personnel unless they reduce; Boards of Education have repeatedly attempted to fire overweight teachers (Allon, 1975).

In light of all the medical and social disadvantages

to obesity, it is understandable that many obese individuals turn to dieting. That dieting is on the increase in our culture is evidenced by Garner, Garfinkel, Schwartz and Thompson (1980). They found a significant increase in the number of articles on dieting in popular women's magazines. But indiscriminant dieting may be more harmful than beneficial. Hawkins and Clement, for example, found that excessive control of eating may promote binging behavior (1980). Other studies point to untoward emotional responses to dieting, such as depression (Stunkard and Rush, 1974). Another problem is that dieting causes the body's metabolic rate to decline. Boyle, Storlein, and Keesey (1978) reported that rats who had been subjected to a period of food restriction gained eighteen times more weight than a control group during a standardized refeeding period. Wooley and Wooley (1979) point out that dieting may have two detrimental effects: (a) it gives food a heightened importance, and (b) it trains the dieter to ignore internal signals of hunger. Later, this lack of awareness may make the former dieter less able to automatically regulate intake and stabilize weight. Wooley and Wooley conclude that the major treatment for obesity may also be a major cause.

In conjuction with negative risks of dieting, one must look at the benefits. Here too this picture is bleak. As Brownell aptly states:

> If "cure" from obesity is defined as reduction
> to ideal weight and maintenance of that weight
> for 5 years, a person is more likely to recover
> from most forms of cancer than from obesity. In
> the late 1950's, Stunkard and his colleagues
> reported that fewer than 5% of dieters lose 40
> pounds or more and that fewer yet keep the weight
> off (Stunkard, 1958; Stunkard and McLaren-Hume,
> 1959). The picture has improved considerably for
> short term loss, but the long-term picture is
> similar (1982, p. 820).

That obesity can have damaging medical, social, and psychological complications for the overweight individual is clear. Current treatments of this disorder are largely ineffective at best; at their worst, they are detrimental. This state of affairs leaves the practitioner in a quandary. Should he or she attempt to treat the condition knowing the risks involved and the poor prognosis? Or should the clinician leave bad enough alone? Neither seems an attractive option.

A question remains unanswered: why has treatment effectiveness been so unsatisfactory? Perhaps, as Wooley and Wooley (1979) claim, the problem lies in the definition of obesity. Many researchers continue to study the obese population as if it were a homogeneous group. Clinicians also operate out of this assumption when they indiscriminantly group obese individuals into one treatment program, or when they use a standard treatment plan for all obese clients.

Researchers have hypothesized that there are subgroups for whom the etiology of the obesity is vastly different

(Atkinson and Ringuette, 1967; Bray, 1973; Bruch, 1973; McReynolds, 1976; and Stunkard 1959). An important question emerges. What are the most relevant diagnostic criteria with which to delineate subgroups? Several researchers point to the degree of obesity as crucial (Charles, 1983; Castelnuovo-Tedesco, 1983; and Schowalter, 1983), whereas Stunkard (1959) classified obese individuals according to their specific eating behavior. These classifications will be covered more fully in Chapter II.

The most well established and theoretically comprehensive classification scheme is that of Hilde Bruch (1973). She claimed that the person's age at the time of the onset of the obesity provides an important clue as to the meaning of the obesity and to the depth of the symptom's interaction with personality development. Bruch suggested that the emergence of obesity at different ages of development suggests distinctive underlying causes. In turn, these dissimilar underlying causes require differential treatments. For example, perhaps individuals who have been obese since childhood need in-depth psychotherapy because the obesity is an ingrained part of the personality. In contrast, those with an adult onset might respond best to shorter behavioral interventions. Thus, delineating subgroups of the obese population may be a critical diagnostic task.

Preliminary theoretical research needs to address

these questions. It avoids the risks of treatment studies, that is, ineffectiveness and potential damage to participants. Through first delineating theoretically-based obesity subgroups and later matching treatments to those subgroups, a more precise understanding of the development, classification, and appropriate treatments of obesity can occur.

Purpose

It is the purpose of this study to determine whether personality differences occur among the obese population in a manner that is predictable and consistent with Bruch's theory. More specifically, do obese individuals with an early age of onset of the obesity feel less effective, less trusting of others, and less aware of their interoceptive cues than obese individuals with a later age of onset? Are they more external in their locus of control? In other words, can age of onset be used to predict the following relevant personality dimensions (a) effectiveness, (b) interpersonal trust, (c) interoceptive awareness, and (d) locus of control? Each of the first three variables will be measured by subscales of Garner and Olmsted's Eating Disorder Inventory (1983). Locus of Control will be measured by two scales, the Weight Locus of Control Scale (Saltzer, 1982) and the Internal-External Scale (Rotter, 1966).

The major demographic variable which will be used to

predict these outcome variables is the age at onset of the obesity. Other variables will be controlled in the prediction equations: percentage overweight, stability of obesity, age, sex, income, education, group membership, and dieting status.

Hypotheses

Primary Hypotheses

1. Obese adults with an earlier age of onset of their obesity will demonstrate a higher level of ineffectiveness than obese adults with a later age of onset.

2. Obese adults with an earlier age of onset of their obesity will demonstrate a higher level of interpersonal distrust than obese adults with a later age of onset.

3. Obese adults with an earlier age of onset of their obesity will demonstrate less interoceptive awareness than obese adults with a later age of onset.

4. Obese adults with an earlier age of onset of their obesity will be more external in their global locus of control than obese adults with a later age of onset.

5. Obese adults with an earlier age of onset of their obesity will be more external in their weight-specific locus of control than obese adults with a later age of onset.

Secondary Hypotheses

6. Obese adults with an earlier age of onset of their obesity will more often be only or youngest children in

their families of origin than obese adults with a later age of onset.

7. Obese adults with a later age of onset of obesity will more often report the occurrence of a significant stressor prior to or at the time of the onset of the obesity than obese adults with an earlier age of onset.

Definition of Terms

Terms relevant to this research are defined generally and operationally.

1. Obesity: The state of being at least twenty percent over normal weight. Normal weight is determined according to the individual's height and sex by the Metropolitan Life Insurance Table of Desirable Heights and Weights (1983).

2. Developmental Obesity: Obesity with its onset between the ages of 3 and 18. The appropriateness of this descriptor will be determined by the perception of the individual as to when he or she first became obese.

3. Reactive Obesity: Obesity with its onset during adulthood, after age 18. This type of obesity is theoretically thought to have its onset after a traumatic event; thus it is seen as the reaction to a trauma. The appropriateness of this descriptor will be determined by the perception of the individual as to when he or she first became obese.

4. Constitutional Obesity: Obesity with its onset during early childhood, between the ages of 0 and 3. The

appropriateness of this descriptor will be determined by the perception of the individual as to when he or she first became obese.

5. Age at Onset (or age of onset): The age at which the individual first became obese. This construct will be measured according to the individual's perception as to when he or she became obese.

6. Ineffectiveness: Feelings of inadequacy, insecurity, worthlessness, and lack of control over one's life. This construct is similar to locus of control except that it contains a component of negative self-evaluation. Operationally it will be measured by the Ineffectiveness Subscale of the Eating Disorder Inventory.

7. Locus of Control: Individual perception of whether events are contingent upon ones own actions or characteristics (internal locus of control) or upon external forces such as luck, chance, fate, or others (external locus of control). This construct is conceptualized as varying along a continuum; it is not a dichotomy. Locus of control will be measured globally by Rotter's 1-E Scale (1966) and specifically by Saltzer's Weight Locus of Control Scale (1982).

8. Interpersonal Distrust: A sense of alienation; a general reluctance to form close interpersonal relationships; or an inability to feel comfortable expressing emotions towards other people. This construct

is to be distinguished from other definitions of distrust such as paranoia and pessimism. Interpersonal distrust will be measured by the Interpersonal Distrust Subscale of the Eating Disorder Inventory.

9. Interoceptive Awareness: The individual's degree of confidence in recognizing and accurately labeling emotions or visceral sensations of hunger or satiation. This construct will be measured by the Interoceptive Awareness Subscale of the Eating Disorder Inventory.

Theory

One of the most influential theorists in the eating disorders field was Hilde Bruch, a practicing psychiatrist who addressed underlying family dynamics and personality development in the origins of obesity. Bruch stated: "It is inconceivable that the excess weight in all these millions of people should have developed on the same basis, or would offer the same clinical or psychological picture" (1973, p. 109). She warned other clinicians against treating the obese as a homogeneous group, a conviction shared by many other authorities (Atkinson & Ringuette, 1967; Bray, 1973; McReynolds, 1976; Stunkard, 1959). Thus, on the basis of her 40 years of clinical experience, she broke down the obese population into three subgroups, each of which will be described in turn.

Reactive Obesity

Bruch described reactive obesity as

> the form most commonly observed in adults. The
> obesity seems to develop in response to an
> emotional trauma, frequently to the death of
> someone close to the patient, or when the fear of
> death or injury is aroused. Overeating and
> obesity appear to serve the function of warding
> off anxiety or a depressive reaction. Though
> infrequent, this type of sudden increase in
> weight is also observed in children (1973, p.
> 126).

People with reactive obesity often have emotional

problems which are hidden away behind a complacent facade.

Instead of expressing or experiencing anger, they become

depressed and then use overeating as a defense. Bruch

noted that this subgroup had a high morbidity and mortality

rate for a whole string of diseases with one exception:

suicide. Traumas, to which this group reacts by

overeating, often lead the non-obese to despair. Bruch

claimed that as a defensive reaction overeating may be far

less destructive than other alternatives. Therefore,

therapeutic interventions that prescribe dieting must be

used with careful diagnosis and caution.

Developmental Obesity

As its name implies, developmental obesity commences

during childhood. Its occurrence is intricately interwoven

into the development of the child's personality and into

the functioning of the family. Bruch described the process

of becoming obese clearly. At birth an infant has a

repertoire of behaviors; two hold special significance for

the developmentally obese, crying and eating. The infant

cries when uncomfortable, whether hungry, tired, or wet.

At first the baby's needs are relatively undifferentiated, but when the caretaker understands those needs and responds appropriately, the child learns to distinguish them. The young individual learns to read and trust his or her bodily sensations, and to trust people to provide care. The child who is responded to appropriately learns that ones cries are heeded; one can control the environment.

But what happens to the child whose crying is ignored or to the child who is overfed to keep the household quiet? The youngster whose needs are not confirmed through accurate and consistent parental responses becomes confused, unable to differentiate sensations such as hunger, sadness, or fear. A depressed and self-preoccupied parent may teach the child to associate love or rejection with food. Bruch described the outcome of this scenario for the developing individual as a failure of interoceptive cues. Thus, the young person cannot accurately assess his or her own sensations. Other theorists point to the frequent need of the obese to turn to external cues for eating, such as time of day, food availability, or food attractiveness, to trigger their eating (Rodin, 1973; McKenna, 1972; Schacter and Gross, 1968). These theories will be addressed further in Chapter II.

Not only does the child fail to develop interoceptive awareness, but through the same parental-child interaction pattern he or she learns interpersonal distrust. The youth

discovers that people cannot be counted on to provide
consistent care. The world cannot be trusted to meet ones
needs. The child may also conclude that something else or
someone else controls the environment. Reinforcements are
not contingent upon ones own behavior. Thus, locus of
control becomes external; feelings of effectiveness are
diminished. Bruch described the "all-pervasive sense of
ineffectiveness" experienced by the developmentally obese
as similar to schizophrenia (p. 334). She found that
children in this group more often held a special position
in the family, that is, the only or the youngest child.

Constitutional Obesity

Bruch gave little descriptive attention to this
subgroup. Like the developmentally obese, these
individuals became overweight during childhood. But their
physical condition is not linked to emotional
maladjustment, personality development, or family
dysfunction. Rather, they are emotionally stable and
relatively adjusted. Metabolic conditions or a
predisposition to obesity may be crucial in the etiology of
this disorder. Although Bruch did not put age limits on
this subgroup, the work of other theorists suggests that
children who become obese before age three tend to have
better emotional adjustment (Bray, 1976; Carrerra, 1973;
Court & Dunlop, 1975).

Overview

Obesity is a pervasive and damaging health problem that affects people's lives medically, socially, and emotionally. It has an impact on ones acceptability to employers, colleges, and peers. Yet its causes are complex and unclear; its treatments are largely ineffective and sometimes detrimental. Research on this topic that leads to better understanding and treatment of the disorder could have a positive impact on many lives. Because current treatments hold potential danger, the most ethical place to start seems to be prior to treatment, that is, at the theoretical underpinnings that could help clinicians differentiate how to treat and whom to treat.

If Bruch's formulations are correct, clinicians should treat obese clients differentially. Those with a reactive, adult-onset kind of obesity may respond best to behavioral methods of stress reduction or grief counseling, depending on the trauma that triggered the reaction. Alternately, developmentally obese patients may need more in-depth, long-term therapy aimed at restructuring the personality. The constitutionally obese may require medical testing and intervention. Family therapy and prevention programs that educate parents might be appropriate interventions to circumvent the onset of this disorder before it begins its destructive course.

In this study an attempt is made to determine the

underlying personality correlates of obesity, and how they
relate to variables such as age of onset. In Chapter II
relevant literature is reviewed; in Chapter III methodology
is presented, including a description of the sample,
measures, design, procedures, testable hypotheses, and
analysis. Chapter IV will consist of the analysis of the
data and Chapter V, the summary, discussion, limitations
and implications.

CHAPTER II

REVIEW OF THE LITERATURE

The purpose of this chapter is to review research relevant to obesity, particularly the factors which differentiate subgroups of the obese population. Research that focuses on global theories of obesity are discussed first, that is, studies in which obese subgroups are not considered. Four major global theories are reviewed, (a) psychosomatic, (b) externality, (c) locus of control, and (d) set point and restraint. A review of attempts at categorization will be followed by age of onset studies. These studies are further broken down into (a) personality studies, (b) treatment studies, and (c) studies of emotional reactions to weight loss.

The Obese Population as a Homogeneous Group

Many of the early researchers envisioned obesity as a single phenomenon. Typically they focused on a factor or personality trait which was thought to be salient in the etiology of all obesity. In a discussion of the tendency to conceptualize obesity as a homogeneous syndrome, Leon and Roth (1979) concluded, "The search for a unitary explanation of obesity does not, at present, appear to be a fruitful avenue of exploration, and the evidence strongly suggests that obesity is not a unitary syndrome" (p. 136). These global explanations are still relevant to current

thinking because they may be valid for specific subgroups of the overweight population. Thus, they will be reviewed here roughly in their chronological order: (a) psychosomatic theories, (b) externality, (c) locus of control, and (d) set-point and restraint.

<u>Psychosomatic Theory</u>

In their development of what later became known as the psychosomatic theory of obesity, Kaplan and Kaplan reasoned:

> If an infant were habitually frightened and neglected by his mother who did not heed his hunger cries promptly, then fright and anxiety associated with being abandoned might become associated with rising hunger pangs and in later life such an individual might be expected to "feel hungry" when faced with a frightening situation... Anxiety can motivate a person to eat once he had learned to diminish anxiety with food (1957, p. 190).

They hypothesized that eating becomes a learned response to internal cues of anxiety or other emotions, rather than to hunger pangs, but they did not qualify this hypothesis based on age of onset. Nevertheless, a flood of research followed their publication. Some of the more well-known studies will be covered here.

Schacter, Goldman, and Gordon (1968) conducted a study in which they subjected obese participants to conditions designed to arouse fear of electric shock. They found that obese individuals ate approximately the same amount of food when calm as when fearful, whereas normal subjects ate more when calm. The researchers claimed that these results were

nonsupportive of psychosomatic theory of obesity, because anxiety did not produce increased eating among the overweight group. However, results are questionable, because the obese clearly differed from the non-obese.

Abramson and Wunderlich (1972) questioned whether obese subjects would react differentially to different kinds of emotional disturbances. They induced "interpersonal anxiety" by giving obese subjects falsified negative feedback regarding their results on a personality inventory. "Objective anxiety" was induced through threat of an upcoming shock. The experimenters found no significant differences in eating behavior of these two "anxious" groups in comparison to a non-anxious obese control group, nor were there significant differences in comparison to normal-weight groups under the three experimental conditions. The researchers concluded that these findings cast considerable doubt on the tenability of Kaplan and Kaplan's psychosomatic theory.

McKenna (1972) invoked anxiety by leading participants to believe that they would be subjected to various physiological measurements; for example, blood samples would be taken with displayed hypodermic needles. He found a significant interaction between weight status and anxiety level; that is, overweight subjects ate more under conditions of high rather than low anxiety, in contrast to normal-weight subjects who ate less under high- than under

low-anxiety conditions. This finding was considered
consistent with psychosomatic theory, and points to a need
for further clarification of the concept of anxiety.
However, eating did not serve to lessen anxiety for either
normal or obese subjects. McKenna found a slight tendency
for subjects to eat more good-tasting than bland food in
the high-arousal state, but almost identical amounts of
bland food under both conditions. Thus, palatibility of
food further complicates these studies, because most of
them used neutral tasting crackers.

In a more recent study, Ruderman (1983) also examined
the relation between level of anxiety and food consumption,
finding that obese subjects ate significantly more when
mildly anxious than when highly anxious, with eating at an
intermediate level for the relaxed state. In contrast,
normal-weight subjects did not significantly differ in
their eating behavior during the relaxed, mildy anxious,
and highly anxious conditions. These findings are in
direct contrast with McKenna's. However, anxiety was
evoked differently in the Ruderman study. She used tapes
describing high-anxiety, low-anxiety, and relaxation
situations, and then measured the anxiety level with the
State-Trait Anxiety Inventory and heart beat monitors.
McKenna's subjects experienced the immediate threat of
medical tests. These very different operational
definitions of anxiety could account for the discrepant

findings. Interestingly, obese subjects did differ from normal-weight subjects in their response to anxiety level in both studies. One possible explanation is that Ruderman's low-anxiety condition is really at a different place on the same scale as McKenna's; that is, her low-anxiety condition is the equivalent of McKenna's high anxiety, and her high anxiety is even more extreme. This suggestion is counterintuitive. It seems that the imagery technique of Ruderman would be less anxiety provoking than McKenna's immediate threat. Perhaps the relationship between anxiety level and eating behavior is curvilinear or perhaps it is confounded by the two different types of anxiety measures described in the Ruderman and the McKenna studies.

Other researchers have addressed the issue of cognition in eating response to arousal. Slochower (1976) found that obese subjects ate significantly more than non-obese subjects when they could not identify the cause of their arousal than when they had a label and reason for it. Anxiety was induced in this study by giving the subject falsified feedback of an elevated heart rate. In contrast to McKenna's finding, eating did serve to reduce anxiety level for the obese group. Results are difficult to compare because of different methods of anxiety induction and different degrees of food palatability.

Lowe and Fisher (1983) found that obese college

females were more emotionally reactive and more likely to engage in emotional eating than normal-weight subjects, but that these results applied to snacks rather than regular meals. A second finding is that obese subjects did not differ from the non-obese in eating behavior following positive emotions, only negative ones.

In conclusion, it is clear that psychosomatic theory is only partially supported, in that obese individuals usually eat differently from non-obese subjects when made anxious. Studies to determine whether obese individuals eat more or less under varying levels of anxiety have been inconsistent. However, confounding variables such as cognitions, food palatability, and level of anxiety need to be controlled. Very different measures of anxiety have been used and this factor makes it difficult to generalize across studies. Findings do suggest that the type of emotion experienced, the degree or level to which it is experienced, and the existence of a cognitive label or reason for the feeling influence whether an obese individual will respond to emotions by eating.

Especially relevant to the present research is Slochower's (1976) finding that the inability to label a feeling or to attribute a reason for it promotes eating among the obese. This inability is similar to Bruch's construct of failure of interoceptive cues. She believes that this inability to read ones own sensations and

emotions corresponds with obesity development for a certain subgroup of the population. Slochower's empirical work supports Bruch's idea that vague, unlabeled sensations promote eating among obese persons. The finding that this relationship holds for the general obese sample that Slochower studied is interesting. That her sample primarily consisted of developmentally obese subjects is likely, because they were male undergraduate students with many more childhood years of living than adult years. Slochower's study shows that their eating behavior is different when they cannot label emotions. But eating behavior in a laboratory may not generalize to normal eating conditons. Whether obese persons consistently experience this phenomenon (inability to label) and whether it is an etiological factor in their obesity remain unknown. Future research needs to address these issues: (a) Are they less able to label their emotions? (b) Is this inability related to the development of their obesity?

The studies reviewed in this section all have one element in common. They focus on eating behavior rather than the development of obesity. These are related but not synonymous constructs. Some normal-weight individuals may have unusual eating behaviors but they are protected by their dietary preferences, metabolism, or activity level. Globally comparing the eating patterns of obese and non-obese subjects will not address this distinction.

Research needs to focus on (a) protective mechanisms within the normal-weight population who have abnormal eating patterns and (b) within-group differences among the obese population that would help to better clarify why not all obese individuals eat in a consistently abnormal pattern.

A final concern about these studies is that they do not consider the age of onset of the obesity. Kaplan and Kaplan (1957) clearly describe the process of learning this psychosomatic dysfunction. It occurs when an <u>infant</u> is habitually frightened or neglected. The process they write about does not describe the adult development of obesity, nor does it explain why adults become obese. Yet researchers who study psychosomatic theory include adult-onset subjects without clarification or analysis of age of onset differences. Future research needs to correct this procedure.

<u>Externality</u>

In constrast to psychosomatic theory, Schacter (1971a, 1971b) hypothesized that obese individuals differed from normal-weight persons because they eat in response to external cues, for example, appearance of food or time of day, rather than to internal cues of emotional arousal. People of normal weight eat in response to internal cues such as hunger or gastric and hypothalamic processes. With the advent of this theory, psychosomatic theory began to acquire the label of "internality theory."

Schacter's original hypothesis developed out of his observation that obese subjects, preloaded with roast beef sandwiches, ate just as many crackers afterwards as obese subjects who had not been preloaded. He concluded that they were eating in response to external cues (food availability) rather than internal cues of satiety. Normal-weight subjects ate fewer crackers if preloaded than if not (Schacter, Goldman, & Gordon, 1968).

Studies of externality theory have produced many discrepant findings, perhaps in part because of differences in the definition of the term "external cue". Operational definitions have varied according to taste, smell, color, or visibility of food, that is, bright versus dim lighting, or clear plastic versus opaque foil wrapping (Rodin, 1981). More general non-food related measures have also been used. For example, Schacter and Gross (1968) used responsiveness to phoney time cues rather than to real length of time since eating. They found that obese individuals are more responsive to external cues of time (falsely arranged to indicate that it is dinner time) and ate significantly more than normal-weight subjects when they believed it was dinner time. Rodin (1973) measured the externality construct by a global non-food-related method, that is, as the amount of responsiveness to distractors and consequent impairment of performance on a proofreading task. She believed that obese persons become globally external, and

that this trait extends beyond eating behavior. Thus, she hypothesized that they would be more distractable because of their external orientation.

To summarize, numerous experimenters have failed to show that overweight persons respond to external cues at a higher rate than normal-weight individuals (Goldman, 1969; Nisbett & Storms, 1975; Nisbett & Temshok, 1976). Evidence is quite clear: all normal-weight persons are not internally responsive; nor are all obese persons externally responsive (Rodin, 1981).

Nor are internal and external reactions as separate as they might seem in light of this discussion. For example, Rodin, Bray, Atkinson, Dahms, Greenway, Hamilton, and Molitch (1977) demonstrated that when food deprived for eighteen hours, externally responsive individuals showed greater insulin response to the sight, smell, and sound of a grilling steak. Similarly, other internal responses such as salivation and changes in blood glucose levels are affected by external stimuli. It would be difficult to state that external cues bring about the eating behavior when there are a number of intervening internal variables. Mitchell (1980), in a review of psychological aspects of obesity, concluded that consistent differences have not been found between obese and non-obese individuals in regards to psychosomatic (internal) eating or externally-cued eating. The obese do not appear to be a

homogeneous group on these dimensions. Future research
needs to better clarify which obese individuals display
each pattern. Furthermore, descriptive research may be the
more promising avenue to this end. Experimental designs
which assess food-related externality must carefully
control for internal/external interactions; for example, a
grilling steak promotes intervening internal responses
which lead to eating. Artificial separations of internal
and external responsivity may not generalize to normal
eating conditions. Thus, external validity is threatened.
The same problem arises that was discussed in relation to
psychosomatic theory: eating behavior evoked in a
laboratory may or may not be replicated in real life and it
may or may not have etiological significance in the
development of the obesity.

Locus of Control

Related to Schacter's theory of externality is
Rotter's concept of locus of control. His construct has
been studied extensively in the obesity research, primarily
using his Internal-External (I-E) Locus of Control Scale as
a measure. According to Rotter (1966) persons high in
internal locus of control believe that they have control
and can influence the course of their lives. In contrast,
externally-oriented individuals believe that luck, fate,
chance, and others control their destinies. The construct
is seen as varying along a continuum rather than as a

dichotomy. Early theorists believed that obese individuals would prove to be more external in their locus of control than their normal-weight counterparts. This hypothesis has not been supported empirically. For example, Gormanous and Lowe (1975) concluded that there was no difference between obese and normal-weight subjects on Rotter's I-E Scale. Other researchers also contend that both internally and externally oriented individuals make up the obese population (Rodin, 1981; Thomason, 1983).

Research has also focused on the treatment implications of locus of control. For example, Balch and Ross (1975) found that individuals high on internality, as measured by Rotter's I-E scores, were significantly more likely to complete a diet program successfully (lose more than eight pounds) than the external group. The behavioral group treatment used is not defined, a problem which hinders the reader's ability to draw conclusions from the study. Perhaps the externally-oriented subjects would have performed better with a different treatment plan.

These theorists, however, studied locus of control as a generalized and stable trait. Mirels (1970) divided it into two independent factors: (a) the belief that ability and hard work rather than luck influence personal outcome and (b) the belief that a citizen can exert control over political and world affairs. Balch and Ross (1975) studied Mirels' two factors, finding that neither appeared to be a

predictor of weight reduction.

Nevertheless, other researchers are moving in the direction of breaking down locus of control as Mirels proposed. Thomason (1983) stated that locus of control is a multidimensional attribute rather than a unidimensional construct. He found that obese individuals were more external on self-control and social system control scales but more internal on the fatalism scale of the Reid and Ware Three Factor Internal-External Scale. This study does not support a generalized external locus of control hypothesis for the obese population, nor does a study by Saltzer (1982) who developed a Weight Locus of Control Scale. She too found internal-external differences among the obese that had important treatment implications; that is, the more internal subjects showed greater weight loss.

One must be careful in drawing conclusions from these studies. While they suggest that obese people as a whole do not differ from the non-obese on measures of locus of control, it is also apparent that obese individuals are not homogeneous with respect to locus of control. Future research needs to address which obese individuals are characterized by each end of this dimension. Are there consistent age of onset differences on locus of control as Bruch suggested?

Past research also supports the hypothesis that locus of control needs to be assessed specifically, in a manner

relevant to the domain of the study, in this case the weight domain.

Finally, the finding that individuals with internal locus of control perform better in treatment programs lends support to the importance of this construct for obesity research. As will be reviewed in a later section of this paper, there are also important treatment differences based on age of onset of the obesity. Research that assesses the correlation between these two variables might prove useful in the understanding of this disorder.

Set-Point Theory and Restrained Eating

A fourth theory of obesity is that of Nisbett (1968) who observed that some obese persons tend to eat in extremes, either very large or very small quantities. They control their eating through conscious restraint rather than a natural desire to eat a moderate amount of food. Once the restraint is broken, however, such individuals often eat large quantities.

Nisbett (1972) stated that both normal-weight and overweight individuals eat to maintain a biologically determined set-point, that weight at which the body will stabilize naturally. He believed that set-point is determined by the number of fat cells in the body. This number is determined early in life. Early weight gains of a moderate amount result in added numbers of fat cells but after a child passes a critical period, later weight gains

result in an increased size of fat cells, but not a greater
number. Weight reduction results in depletion of fat cell
size but not number. Thus, an overweight child will always
have an excess number of fat cells. If that individual
attempts to lose weight, fat cells become depleted and send
messages to the brain that the body is starving. Once
obese via excessive fat cells, the body beckons the
individual back to that state or set-point. Some people
may choose to stay below their biological set-point because
of cultural pressures, but such individuals are using
restraint; they are food-deprived, and consequently more
vulnerable to external food cues. Nisbett claims that
victims of starvation, who also experience depleted fat
cell size, are similarly vulnerable to external eating
cues.

Many overweight as well as normal-weight persons keep
their weight below their biological set-points through
restraint. This similarity accounts for the inconsistent
findings of previous research. Both obese and
normal-weight individuals who are at their biological
set-points are able to eat in an internal, unrestrained
way. Restrained individuals, whether obese or not, are
below their biological set-points, and consequently are
more vulnerable to external cues to eat. If tenable, this
hypothesis could help explain inconsistent findings among
previous internality/externality research.

In light of Nisbett's work, Herman and Mack (1975)
reclassified all weight groups into restrained and
unrestrained eaters. They developed a restraint scale
which measures the amount of concern given to dieting,
regulating weight, and controlling food intake. Restraint
is conceptualized as a construct that varies on a continuum
from highly restrained to unrestrained.

One problem in evaluating set-point theory with the
Restraint Scale is that restraint measures concern with
weight rather than behavioral success in staying below
set-point. In other words, concern about eating may not
translate into action.

Herman and Mack found, as hypothesized, that
restrained eaters temporarily gave up restraint when they
believed they had overeaten. Normal-weight college-aged
females were preloaded with milkshakes and then asked to
taste and rate ice cream. The amount of ice cream eaten
served as a deceptive measure to determine quantity eaten
after preload. Individuals with low restraint scores ate
in a pattern similar to what Schachter described as the
internal regulation of the non-obese; that is, they ate
less ice cream after a preload and more without a preload,
apparently responding to internal satiety cues. In
contrast, highly restrained eaters ate significantly more
after a preload than they ate without a preload.
Evidently, once restraint is given up, these subjects

ignore internal satiety and respond instead to external availability of ice cream. This pattern is called counterregulation, the eating of increased amounts after a preload. Obese individuals unintentionally included in the study were not significantly more or less restrained than normal-weight subjects, a finding also consistent with the experimenters' hypothesis.

Other studies on restrained eating are also supportive. For example, Hibscher and Herman (1977) divided male undergraduates at three weight levels into restrained and unrestrained classifications. They found that restrained eaters counterregulated after a preload whereas unrestrained eaters compensated for calories at all weight levels. Degree of restraint rather than degree of overweight predicted eating behavior. Additionally, elevated levels of free fatty acids in the blood, once thought to be correlates of obesity, in this study were associated with dieting restraint rather than degree of overweight. This finding in particular points to the need to assess an individual's dieting status when including him or her in obesity research.

In an attempt to understand better the process of counterregulation, some researchers began to study the cognitive components of restraint. Polivy (1976) found that restrained normal-weight male subjects who perceived a preload as high calorie ate significantly more during the

test period than restrained normal-weight subjects who
believed the preload was low calorie. Actual calorie value
was the same for both groups. This study lends support ot
the notion that restrained eaters counterregulate when they
believe they have overeaten.

Spencer and Fremouw (1979) conducted a similar study
on normal-weight and overweight female subjects. These
subjects were also divided into restrained and unrestrained
groups. The experiment was again run as a taste test with
half of the subjects from each weight level told that the
preload was a very high calorie drink and half that it was
very low in calories. As predicted, the restrained
subjects counterregulated when they believed they had
consumed a high number of calories, whereas belief about
calories did not significantly change the consumption level
of unrestrained subjects. Body weight did not
significantly affect these results.

Ruderman and Wilson (1979), however, conducted a
similar study with differing results. They found that
while degree of restraint could predict counterregulation
in normal-weight subjects after a supposed high calorie
preload, it was not as good a predictor among the obese.
Unrestrained obese individuals regulated their food intake
after a preload, but restrained obese ate considerably less
than restrained normals; that is, they did not clearly meet
criteria for counterregulation. Thus, the authors

cautioned against generalizing to obese subjects from studies using restrained and unrestrained normal weight subjects.

Other studies focus on the effect of anticipated deprivation, yet another cognitive dimension. In a study by Lowe (1982) subjects who believed they would soon be faced with food deprivation ate significantly more after a preload than subjects from a non-deprivation group. In a second follow-up experiment, Lowe found that highly restrained women ate significantly more than the less restrained women. Lowe speculates that chronic dieters are highly restrained individuals and that they overeat in response to anticipated deprivation that will occur when they resume dieting.

While the results of these studies are generally supportive, they also suggest that cognitive influences affect restraint and counterregulation. What other cognitive influences will be uncovered remains to be seen.

Several researchers returned to early hypotheses in the study of obesity, specifically psychosomatic theory, to determine how it would hold up in relation to restrained and unrestrained eating. Herman and Polivy (1975) examined restrained and unrestrained normal-weight female subjects. They found that restrained subjects ate somewhat more (but not significantly more) when anxious as compared to when calm. Thus, unrestrained eaters may resemble what earlier

theorists would have called "normal-weight" subjects; and
restrained eaters, obese subjects. Herman and Polivy
suggest that perhaps anxiety disrupts the abiltiy to
restrain oneself which can be maintained at other times.
In a second study by Polivy and Herman (1976), restrained
eaters gained weight when depressed. Unrestrained
subjects, in contrast, lost weight when depressed.

Restrained eating is one of the most studied topics in
the current literature on obesity. While promising in its
implications, it only indirectly supports set-point theory.
Until biological measures of set-point are determined, the
theory will remain controversial.

There are several problems with set-point theory as an
explanation of obesity. The construct has been frequently
studied on normal-weight samples, yet Ruderman and Wilson
(1979) point out that it is not as impressive in predicting
the behavior of obese individuals. They caution against
attempting to generalize from normal-weight to obese
subjects.

The theory also does not explain adult-onset obesity.
Were these individuals restrained as children? Did they
for some reason give up that restraint as adults? This
explanation seems unlikely because very young children
rarely feel social pressure to reduce, nor do they often
have the ego controls to regulate their weight through
intentional restraint. Obese children who later become

normal-weight adults also pose a problem. Their elevated number of fat cells (developed via early overfeeding) must be at semi-starvation levels of depletion in order for the person to maintain a lower weight level. It seems implausible that young children can regulate weight through such ego mastery if their biological impulses are demanding to be fed. Age of onset is an important dimension in restraint and set-point theory, because the number of fat cells is thought to be determined early in life. Research on restrain and set-point that considers age of onset will be reviewed in a later section of this chapter.

Several interesting but unanswered questions emerge from this literature. Do restrained normal-weight individuals indeed have more fat cells than unrestrained normal-weight persons of the same body build? Do obese individuals who are restrained report a lessening need for restraint following surgical procedures that remove large numbers of fat cells? Empirical research which answers questions such as these would provide better and more direct evidence than studies of behavioral differences.

Empiricial support of this theory does have important implications: (a) Obese individuals are not a homogeneous group on yet another dimension. (b) Obesity studies need to control for the effects of dieting. (c) An underlying construct such as restraint may be present while actual weight (a symptom) fluctuates. This third statement points

to the need for researchers to look at historical weight shifts of individuals rather than static measures of weight at one point in time.

Classifications of Obesity Subgroups

Attempts to find an "obese personality" or a single dimension underlying obesity have failed miserably (Anath, 1982; Mendelson, 1966; Stunkard, 1962; Weinberg, Mendelson, & Stunkard, 1961). Stunkard (1962) concluded that because we cannot find psychological characteristics that will consistently distinguish obese from non-obese persons, we must conceptualize obesity not as a single disease but as a disorder of multiple etiology. He stressed the appropriateness of classifying the obese population into a variety of subgroups and then examining the characteristics and etiology of each. A flood of researchers attempted to do just as Stunkard described. Some of the major classification schemes will be reviewed.

Natural, Reactive, and Developmental Obesity

Hilde Bruch classified the obese into three main subgroups (1973). In her first subgroup, the naturally obese, weight excess is not related to abnormal psychological functioning, but may be thought of as a constitutional. Although the age of obesity onset is during early childhood (ages 0-3), the subject experiences no body-image disturbance. Thus, the constitutionally obese are neither psychologically disturbed, nor do they

have an eating disorder. While this subgroup may have psychological problems, so does the general population, and the issues are secondary or unrelated to the weight disturbance.

Bruch's other two subgroups fall more under the heading of eating disorders. Developmental obesity has its onset in childhood. It is thought to be caused by dysfunctional interactions among family members; consequently, abnormal personality development and body image disturbance are part of the clinical picture. Bruch described a process in which the mother, in an attempt to compensate for ambivalent feelings towards her child, alternates between overfeeding and neglectful feeding, neither of which is related to the child's needs. Thus, the child does not learn to associate hunger with feeding, and interoceptive awareness becomes distorted. The child develops pervasive feelings of ineffectiveness, because his or her cries for food or comfort are attended so inconsistently. The early age of onset accounts for the accompanying body-image disturbance. Also learned by the child is interpersonal distrust. A child that is not fed appropriately learns that others cannot be trusted to meet ones needs.

The third classification, reactive obesity, occurs in response to emotional trauma, for example, death in the family, birth of a child, or divorce. Because the age of

onset usually is in adulthood, body-image disturbance is atypical. These individuals tend to overeat in response to boredom, depression, or other emotional reactions. Weight is often unstable, with active phases of weight gain during stressful periods interspersed with static periods of weight stability.

It is interesting that Bruch incorporated concepts similar to three other major theories into her schema, yet she did not find them contradictory. Similarity to psychosomatic theory is found in her speculation that the reactively obese inappropriately eat when depressed, bored, or anxious. Within the developmentally obese, however, failure in introceptive cues occurs, so that these individuals learn to respond to external cues such as food availability. The global ineffectiveness experienced by the developmentally obese also overlaps with Rotter's construct of external locus of control. These children learn that mother, rather than the self, controls reinforcement. Bruch's ability to sensibly combine these three major theories is an appealing aspect of her theory, although she did not expand upon her ideas in the biological realm as does set-point theory. She believed that the etiology of obesity includes a complex interweaving of psychological, social, and biological factors. Age of onset may be an important key to unravel these underlying factors.

Eating Patterns

Obesity subgroups also have been classified according to their eating behaviors. In a classic study Stunkard (1959) described three patterns of eating among the obese. The first, the "night eating syndrome" was described and studied in an earlier study (Stunkard, Grace, & Wolff, 1955). Obese individuals with this pattern eat large quantities of food at night, with at least 25% of their total calories for the day eaten after the evening meal. The syndrome is accompanied by sleeplessness and morning anorexia. The pattern is not constant, however, tending to occur during periods of life stress, with weight gain at that time. Eating may occur during the midst of an agitated depression, but the emotions pass by morning. In contrast to other eating patterns, there was a notable absence of self-condemnation. This pattern has similarities to Bruch's category of "reactive obesity".

The "eating binge" is Stunkard's second pattern. Ingestion of enormous quantities of food, with reports of up to 20,000 calories in one binge, occur during periods of life stress. There is severe discomfort and self-condemnation afterwards.

Stunkard's third pattern has been described rarely in the literature (Mendelson, 1966). In the "eating without satiation" pattern, the individual experiences little appetite prior to eating, but difficulty stopping once

eating has begun. Stunkard reports that this pattern is relatively common among a group of obese individuals with extensive damage to the central nervous system. A comment of Stunkard's is worth noting. Because his population is a clinical one, it may not be representative of obese persons within the general population. The same criticism could be made of Bruch's classification system.

Weight Differences

Castelnuovo-Tedesco and Schiebel (1975) point out that few efforts have been made to compare and contrast psychological features of persons with various levels of obesity. They claim that the personalities of persons who are twenty pounds overweight may be vastly different from these of individuals carrying an extra two hundred pounds. As a first step towards differentiating personality based on levels of obesity, they studied a sample of superobese subjects. Findings suggest no serious psychiatric illnesses among this group, but some personality disturbance. Passive-aggressive and passive-dependent traits were especially evident. The age of onset in all cases was during childhood or adolescence. MMPI profiles suggested that the group was superficially extroverted and impulsive. Contrary to popular belief, depression was not a characteristic, but many displayed a conscious effort to disguise feelings of irritability, contentiousness, and defiance. Other emotions were similarly blocked

expression, corresponding to a low level of trust in others, high privacy needs, and excessive autonomy. This study suggests that perhaps there is a positive correlation between superobesity and Bruch's developmental onset, because the superobese have (a) earlier onset and (b) lack of the depression evidenced in the reactively obese.

Current researchers are calling attention to the lack of empirical information on the superobese subgroup (Charles, 1983; Castelnuovo-Tedesco, 1983; Kral, 1983; Schowalter, 1983; Wise, 1983). Sarah Charles questions whether morbid obesity may lead to increased psychopathology or is a factor unrelated to psychological status. She calls for increased attention to this subgroup, in comparison to other obese subjects, because the health risk is so high. Wise calls for a study of cognitive styles of these patients, because other directions have not seemed promising. Thus, there exists a paucity of research on the subject, perhaps because of cultural prejudice aimed at this population, or perhaps because they tend to seek surgical and medical treatments from physicians rather than psychological interventions. At any rate, weight level is an important characteristic that should be considered in research on this topic.

Age at Onset Studies of Obesity

An extensive amount of recent obesity research considers age of onset as an independent variable. These

studies will be categorized into those which consider
(a) personality and within-subject differences,
(b) treatment effectiveness, and (c) emotional reactions to
weight loss.

Personality Differences

Several researchers studied the personalities of obese
children themselves, rather than of adults with childhood
onset. Kay (1981) found that obese children had higher
scores on the MMPI Lie Scale, suggesting that they were
less comfortable in sharing their feelings about
themselves. She also found that they were more field
dependent and manifested more body-image disturbance than
their normal-weight peers. She found no significant
difference in self-concept. Mendelson and White (1982)
found that obese children had significantly lower
body-esteem than normal-weight children; Geiger (1978)
similarly reported that they display weak body boundaries
and view their body fat as a shield between themselves and
the outside world. Other researchers have described the
discrimination they experience among their peers and their
corresponding problems with interpersonal relationships
(Alessi & Anthony, 1969; Mathews & Westie, 1966). Whether
these differences continue into adulthood will be
considered next.

Descriptive studies of juvenile-onset subjects have
demonstrated that these subjects tend to share certain

personality traits: indirect expression of hostility and overcontrol of emotions (Atkinson & Ringuette, 1967). Castelnuovo-Tedesco and Schiebel (1975) found passive aggressive personality features, limited introspective ability, and lack of emotional fulfillment which was pacified with food. These studies may contain confounding variables that make their interpretation difficult: subjects were hospitalized, in treatment, and/or at least 100% overweight. The findings would be more meaningful if the juvenile-onset individuals had been compared with adult-onset subjects.

Numerous studies compare personality traits of juvenile-onset to those of adult-onset obese individuals. Studies that support age of onset personality differences include one by Creekmore (1984). She found that the older the onset age, the greater was the degree of self-acceptance and the capacity for intimate contact. There were no significant differences on other variables, however, such as the Feeling Reactivity or Autonomy Subscales of the Personal Orientation Inventory.

Numerous studies report significant differences in body image. Stunkard and Burt (1967) found that body size overestimation and the perception of being externally controlled were associated with obesity during adolescence, whether the onset was in childhood or the teenage years. Stunkard and Mendelson (1967) similarly reported that obese

persons whose overweight began in childhood are more
overweight, more difficult to treat, and have more
emotional difficulties than adult-onset subjects,
especially in their body images. Fitzpatrick (1976) found
a similar pattern among black, low-income adolescents.
Girls with an early onset of obesity had more body-image
disturbance than their late-onset peers. Turian (1980)
found the same pattern as did Garner, Garfinkle, Stancer
and Moldofsky (1976), that is, that juvenile-onset obesity
was associated with disturbed body image whereas
adult-onset obesity was not.

Several researchers (Loftis, 1981; Pearlson, Flournoy,
Simonson, & Slavney, 1981; Schwebel, 1978) found
differences in body-image disturbance between age of onset
groups. As predicted, childhood-onset subjects were more
disturbed on this dimension than adult-onset subjects.
Pearlson et al. found, moreover, that with increasing
obesity, these subjects increasingly overestimated their
body widths. This is an interesting finding when one looks
at the varied definitions of "obesity." Loftis, for
example, defines it as low as 15% over normal. This is but
one confounding variable which might help explain these
conflicting results. Schwebel recommends controlling for
the duration of obesity and using better defined categories
of juvenile- and adult-onset.

Externality has also been subjected to scrutiny for

age of onset differences. Schumaker (1976) observed that juvenile-onset obese subjects ate significantly more candy kisses during a bogus test than did the adult-onset subjects. This finding suggests that they are more sensitive to external cues. In contrast, Lynch (1984) found that early age of onset subjects were no more impaired by distraction, and thus no more external than the late-onset participants, when administered the Digit Span Subtest of the WAIS. These two experiments are difficult to compare because of the very different measures of externality.

Rodin, Slochower and Fleming (1977) conducted four experiments which would compare outcomes on various measures of externality. Some of the measures they used were not food related, such as accuracy of time perception and degree of emotional response to positive, negative, and neutral pictures; others tested responses to varying degrees of food salience or palatability. They found no significant correlations between either age of onset or degree of obesity to these various measures of externality. Although the researchers predicted that there would be similar outcomes when using non-food-related versus food-related measures of externality, they found that childhood-onset subjects who were among the higher levels of obesity were more responsive to cue prominence of food than less obese subjects. Thus, food-relevant measures

were useful in pointing out interaction effects between age of onset and degree of obesity. Non-food-relevant measures were not useful. These studies also support the idea that obesity is a complex disorder for which confounding varibles, such as level of obesity, must be statistically or empirically controlled.

Restraint has also been correlated with age of onset of obesity. O'Neil, Paine, Riddle, Currey, Malcolm, and Sexauer (1981) found that juvenile-onset obese subjects experienced significantly more restraint in their eating than adult-onset obese, based on their scores on the revised Restraint Questionnaire.

In a study by Adams (1981) juvenile-onset obese, adult-onset obese and normal-weight women were significantly different in the number of overweight close relatives and levels of depression. Consistent with Bruch's hypotheses, adult-onset participants experienced significantly higher levels of stress than the other two groups.

Three other studies found no differences on multiply scaled personality profiles. Linet and Metzler (1981) reported no significant differences between adult-onset and juvenile-onset subjects on anxiety, depression, obsessivity/compulsivity, somatization, and interpersonal relations as measured by the Hopkins Symptom Check List. McLaughlin (1975) found no significant differences on

measures of social accomplishment, ego strength, and field
differentiation. Differences in field dependence, body
image, and intropunitiveness were also not significant
(Morck, 1976).

With the advent of set-point theory, fat cell
differences between early- and late-onset individuals have
become of interest. In 1968, Hirsch and Gallian
established the means to count individual fat cells and to
determine actual cell size. It has been consistently
established that childhood-onset obese have significantly
more fat cells than adult-onset obese (Hirsch and
Batchelot, 1976; Hirsch and Knittle, 1971; Knittle,
Timmers, & Ginsberg-Fellner, 1979; Sjostrom & Bjorntorp,
1974). Several researchers also assessed the interaction
between fat cell number and weight loss. Hirsch and
Knittle (1970) found that the hypercellularity of the
juvenile-onset subjects persisted following weight loss.
Krotkiewski, Sjostrom, Bjorntorp, Carlgren, Garellick and
Smith (1977) found that hypercellular obese persons lost
weight faster than persons with fewer cells, but that they
were less likely to maintain the loss.

Extrapolating from the fat-cell studies, Schumaker and
Wagner (1977) hypothesized that obese individuals with an
early age of onset would eat in response to hunger rather
than to external food cues, because of their elevated
number of fat cells. Late-onset subjects would do the

opposite. These hypotheses were not supported. Late-onset subjects ate no more Hershey's kisses when they were visible through a clear plastic wrap than when they were covered with foil. This study exemplifies methodological problems not uncommon among the obesity research. Degree of hunger was neither assessed nor controlled, and the study was conducted over the dinner hour of 6:00 to 8:00 p.m., with no assessment reported of who had eaten dinner and who had not. The clear plastic wrap used on the kisses was an unusual wrapping that could have confounded results. This study was a deception study, but no reported attempt was made to determine whether subjects were indeed deceived, an unlikely event if some obese subjects are unusually aware of the external environment. Another problem common to this type of research is the definition of early-onset versus late-onset groups. For this study the age of 15 was used as a cutoff, but any arbitrarily chosen age would transform age of onset, a quantitative variable, into a qualitative one. Thus, the ANOVA design does not make use of the highest possible level of measurement. A secondary finding of this study is quite interesting. The researchers found no correlation between degree of obesity and age of onset. This observation warrants further investigaton, however, because of the large range of ages that the researchers lumped into each category.

Treatment Effectiveness

The question of which age of onset group performs better in treatment must, of course, always be viewed in light of the specific treatment and the kinds of clients those treatments tend to draw. For example, a hospital inpatient program almost invariably draws superobese individuals who may have complicating medical problems which act as motivators to lose weight. Outpatient programs draw patients who are usually less overweight but may systematically vary in age, education, or duration of obesity.

Several studies have noted differences in treatment results that depend on age of onset. Silverstone and Cooper (1971) found that women with an onset of obesity late in life lost significantly more weight than those with early onset. These were hospitalized clients who were suffering from refractory obesity, that is, they remained overweight in spite of repeated attempts to reduce. Jeffery, Wing, and Stunkard (1978) found the exact opposite: the maturity-onset individuals lost significantly less weight. However, they were also significantly heavier than the juvenile-onset group.

Two studies obtained mixed findings. Genender, Wellisch, Pasnau, Fawzy, Quinn, Dornfield, and Maxwell (1982) studied a large sample (N = 595) of obese adult outpatients who participated in a 300-calorie per day

liquid diet treatment program. They found that teenage-onset patients left treatment significantly more obese than adult-onset patients not because of lesser performance but because they entered treatment more obese. Childhood-onset patients left treatment less obese than the teenage-onset group but more obese than the adult-onset group. Although it was hypothesized that early-onset obese patients would drop out of treatment earlier because of their untoward responses to treatment, this hypothesis was unsupported. Their actual emotional reactions were not measured. Thus, it is difficult to ascertain why they did not drop out. Did they not experience untoward reactions or did the form of treatment help them to deal with these psychological reactions effectively? If we assume that juvenile-onset obese adults have more fat cells than adult-onset individuals, the finding that these three groups lost weight at a fairly equal rate contradicts earlier findings (Krotkiewske et al., 1977). However, the differences in the degree of overweight of these three groups may have confounded results. Teenage-onset patients in the 150% to 250% overweight category did lose weight faster than their adult-onset counterparts.

Fisher (1982) hypothesized that locus of control and age of onset would act together as predictor variables for success on a three-month behavioral weight control program, so that early-onset/external subjects would have the least

success and late-onset/internal subjects the most success. Locus of control was measured globally with Rotter's Internal-External Scale and specifically with the Reid and Ware Three-Factor Locus of Control Scale. The hypotheses were not supported. Early onset of obesity was significantly related to maintenance of weight loss at a six month follow-up, but not to the loss itself at three months. There were no significant correlations for locus of control. Fisher suggests that different mechanisms may underlie short-term weight loss, and long-term maintenance success, a complicating factor that needs to be assessed in treatment studies.

Several studies found no difference in treatment effectiveness based on age of onset. Balters (1974) could not confirm his hypothesis that childhood-onset individuals would terminate earlier than adult-onset subjects. Cochrane (1984) found that age of onset, among other variables, did not predict which obese subjects would successfully complete a hypnosis treatment program. However, he screened subjects based on their suggestibility. This procedure may have differentially selected from the age of onset groups. Clasen (1978) also noted that juvenile-onset subjects did not drop out of treatment earlier, nor did they lose significantly less weight.

Emotional Reactions to Weight Control Programs

Early reports warned practitioners about the potential adverse effects upon patients who were treated for overweight. Depression, often severe, was considered a major potential hazard (Bruch, 1952; Brosin, 1954; Hamburger, 1951). More recent efforts are often attempts to ascertain which subgroups of obese patients are most at risk and for which type of treatment.

Juvenile-onset obese adults have been reported to respond less favorably than adult-onset subjects (Bruch, 1973). Exhaustion, anxiety, severe depression, and the inability to see themselves as the thinner in spite of considerable weight loss have been reported in the literature (Glucksman & Hirsch, 1968; Glucksman, Hirsch, & McCully, 1968; Grinker, Hirsch, & Levin, 1973; and Rowland, 1968). Vulnerability of juvenile-onset obese patients may cause them to abandon weight reduction programs (Stunkard & Rush, 1974).

Frequently cited is the study by Grinker et al. (1973) of five severely obese patients with adult onset of obesity who were treated with a 600-calorie per day liquid formula diet during a long-term hospitalization. Utilizing a behavioral rating scale and the Mood Adjective Check List as measures of affective response to weight reduction, the researchers reported a lack of increased feelings of anxiety or depression among this sample. Demanding

behavior and somatic complaints also decreased. Food preoccupation initially increased but then returned to normal levels by the final maintenance period. Similarly, activation (vigor) diminished during weight reduction, but rose during the maintenance period. These findings are in stark contrast to the responses of three juvenile-onset obese subjects undergoing similar hospitalization procedures. These subjects experienced increased stress, depression, anxiety, and distrust, while their general activation (vigor) decreased. Problems with this research are that the sample is small and findings may not be generalizable to a more moderately overweight group. External validity is also limited because the treatment is more severe than most programs, that is, it involves hospitalization and an extended liquid formula diet. Rowland (1968) reports similar reactions, depression and withdrawal, among his six juvenile-onset dieters.

Grinker, Glucksman, Hirsch, and Viseltear (1973) conducted an interesting study on the time perception changes of juvenile-onset and adult-onset hospitalized superobese subjects. Early theorists, Francois and Hoagland, (cited in Grinker et al., 1973) believed that body rhythms are regulated by an internal clock which is sensitive to metabolic changes. Thus, an increased metabolic rate speeds up internal time whereas a decreased rate has the opposite effect. Subjects with an increased

body temperature or hyperthyroidism usually overestimated the duration an auditory stimulus (more internal time than actual external time had passed). In contrast, depressed individuals or persons who have injested barbiturates underestimate the length of an auditory stimulus (less internal than actual time had passed because of the slowed internal clock). Grinker et al. found that after weight reduction juvenile-onset obese subjects began to underestimate the duration of standard intervals and that the restitution of a maintenance diet did not affect the pattern of underestimation. Neither the adult-onset nor a normal-weight comparison group showed a change in time perception nor a significant underestimation. In fact, normal-weight subjects tended to overestimate time duration before, during, and after treatment. These changes among the obese group correlated significantly with an increase in depression described in a previous study (Grinker, Hirsch, and Levin, 1973). These findings suggest that at least among the superobese, age of onset may have important treatment implications.

In contrast to the previous findings, Kollar and Atkinson (1966) found some massively obese persons who lost weight with relatively little emotional upset, even though they had been obese since early childhood. Similarly, Ashwell, Durrant, and Garrow (1978) found that a juvenile-onset obese group did not respond to weight loss

less favorably than an adult onset group. However, this study was of short-term weight loss (3 weeks) and the average weight loss was only 10 pounds.

It seems reasonable that reactions to treatment may well depend on the amount of weight lost as well as the length of time in treatment, the severity of treatment, and the appropriateness of the match between client needs and treatment provisions. In a review of the literature, Stunkard and Rush (1974) concluded that persons with childhood onset of obesity seem more vulnerable to untoward reactions to dieting than to those with adult onset. Furthermore, severe caloric restrictions may produce symptoms more readily than total fast, and outpatient treatment may be more stressful than inpatient treatment. Thus, reaction to treatment studies are difficult to interpret because of confounding variables and limitations to external validity.

In spite of their limitations, these studies demonstrate that age of onset differences do have important treatment implications. Individuals do vary in their reactions to weight control programs and the effectiveness of those programs for them based on age of onset. But researchers have not answered the question of why individuals of varying ages of onset react differentially to treatment programs. Are there relevant personality dimensions which may help to explain why treatments vary in

their effectiveness based on age of onset? Answering this question would enable researchers and practitioners to better match subjects to treatments. Only with such a logical rationale (or in the event of a high degree of risk attributed to the obesity or a high degree of potential benefit from weight loss) can such treatment studies be considered ethical. Poor prognosis and numerous hazards make dieting programs a poor treatment method, unless a sound rationale for diagnosis and treatment selection can be uncovered. Hopefully, more systematic assessments of intraindividual factors could lead to matching individuals to treatment types, so that interaction studies of intraindividual factors and treatment effectiveness could follow.

Summary

Several global theories of obesity (those that study the obese as a homogeneous group) were reviewed in this chapter. The first of these, psychosomatic theory, hypothesizes that obese individuals eat in response to internal emotions such as anxiety. Results of empirical tests of psychosomatic theory are inconclusive, but it is apparent that "anxiety" in the studies may be confounded by cognitions about the anxiety, level or degree of anxiety, type of anxiety (interpersonal or objective), palatability of food, as well as the age of onset of the obesity.

Externality theory hypothesizes the opposite of

psychosomatic theory, that obese people eat in response to external cues (e.g., appearance of food or time of day) whereas normal-weight individuals eat in response to internal cues of hunger. Experimenters have failed to show that overweight individuals respond to external cues at a higher rate than normal weight persons. The variable "externality" has been defined in many unsimilar ways, a problem that makes it difficult to generalize from these studies.

External and internal cues do not appear to be separate dimensions, because they interact with each other within the individual person. It is quite clear that all obese individuals can not be so simply categorized as internal or external.

Nor do obese persons globally differ from the non-obese on measures of locus of control. The current direction of theorists is to break down the construct into situation-specific dimensions, which may be better predictors of behavior.

Restraint theory was also reviewed. Researchers found that both restrained and unrestrained individuals constitute the obese population, and that it is a promising construct as a predictor of behavior. Thus, (a) the obese population is not a homogeneous one and (b) an underlying personality dimension predicts behavior better than mere obesity per se. Empirical support of "restraint" as a

theory also implies that future research needs to control for the effects of dieting.

In general these global studies have produced inconsistent, frequently confounded empirical findings. Attempts to classify subgroups of obesity have been made on the basis of age of onset, eating patterns, and level of obesity. Age of onset is most relevant to the present study because it has been demonstrated to separate the obese population into subgroups in a manner that delineates differences in personality and reactions to treatment.

Numerous studies have been conducted on differences between obese individuals with different onset ages of the condition. Personality differences such as self-acceptance, capacity for intimate contact, body-image distortion and externality, emerge in one study and then disappear in another. Problems in this type of research could well account for these discrepancies. Inconsistent classifications of onset groups with highly varying cutoff ages make studies difficult to compare. Onset groups also may tend to be different in regards to the degree of overweight and current dieting status.

Mischel (1981) believes that instruments used to assess personality dimensions need to be sensitive and specific, in contrast to many of the measures cited in the literature.

Treatment studies also produce mixed results. While

numerous researchers report differential success in treatment based on age of onset, these studies are additionally confounded by the type of treatment program, the length of the program, the amount of weight lost, and the point in time at which success is assessed. External validity is often limited by the specific degree of obesity of the sample. Untoward responses to dieting have also been reported among the early-onset individuals. While this claim has been generally supported, the studies are also hampered by the previously cited limitations.

In conclusion, this review of the literature suggests numerous implications for future research.

(1) Conceptualization of obesity as a homogeneous disorder is outdated. More effort needs to be channeled into the accurate description of the characteristics of obesity subgroups.

(2) Psychosomatic theory (Kaplan and Kaplan, 1957) and externality theory (Schacter, 1971 b), although contradictory, are each partially supported by research. It is now clear that not all obese individuals are external in their orientation, nor do all obese subjects respond to anxiety with increased eating. Hilde Bruch's developmental theory of obesity nicely integrates these two orientations so that different types of obesity and their development are plausibly explained. Her work merits further empirical study.

(3) Research on restraint theory demonstrates the importance of the assessment of dieting status in future obesity research.

(4) Locus of control has important prognostic implications in the treatment of obesity, in that internally scoring individuals are typically more successful. Because the obese population is not homogeneous on this construct, it would be helpful to ascertain how this characteristic is distributed among the population.

(5) Locus of control needs to be assessed specifically to the domain under study.

(6) Age of onset is a promising method to categorize subgroups of the population. Numerous personality differences and treatment implications have been noted among early- versus late-onset subjects.

(7) A major problem with age of onset studies is the variety of cutoff ages which have been used to classify onset groups. This complication makes comparisons across studies difficult. Transformation of a continuous variable into a categorical one also means a loss of information to the researcher.

(8) Age of onset studies need to control for a significant number of potentially confounding variables such as percentage overweight, dieting status, current age, and stability of the obesity.

(9) Because the prevalence of obesity varies according to race, sex, and socioeconomic status, the effects of these variables should also be monitored.

(10) Because treatment is risky and prognosis is poor, descriptive research may be more ethical and beneficial than treatment studies at this time. Once classifications of obesity and relevant diagnostic criteria are established, treatment types and obesity subgroups can be more systematically matched and interaction effects more precisely assessed.

CHAPTER III

METHODOLOGY

In this chapter, characteristics of the research participants, measures, data collection procedures, testable hypotheses, design, and statistical analyses will be discussed.

Research Participants

The sample studied was comprised of 164 obese adults from an urban area in the midwestern United States. They were at least 20% overweight as determined by the Metropolitan Insurance Tables (see Appendix F). To remove confounding variables from the study, participants were selected with no history of anorexia nervosa or bulimia.

Participants completed a Personal Data Sheet from which demographic data were taken (see Appendix D). It will be presented here for descriptive purposes. Hypothesis tests including these data will be presented in Chapter IV.

Group Membership

Six sources of volunteers that were approached agreed to participate in the study: group one, a nationally organized self-help group that encourages abstinence from compulsive eating; group two, a social/political group that promotes self-acceptance and cultural-acceptance of obesity; group three, volunteers from a hospital staff, as well as their family and friends, who responded to a

newsletter request for their participation; group four, an
independent local support group with no national
affiliation; group five, a hospital weight control group
which is lead by a nutritionist who utilizes behavior
management and educational methods to encourage weight
loss; and group six, another independent support group that
meets weekly to encourage weight loss and maintenance
primarily through weight recordings, contests, and prizes
for weight loss.

These six groups constituted the total sample of 164
participants. The largest of these groups was the fourth
group with 55 participants; the smallest, the second group
with 12 participants. A more complete breakdown of group
membership is presented in Table 3.1. Analyses computed to
determine differences between groups will be presented in
Chapter IV.

Of course, group members who did participate in the
study constituted only a portion of the membership of each
group. For the first group, 38 out of the 102 people
present participated, or 37.25%. Some of the people who
did not participate were ineligible because of their
history of anorexia nervosa or bulimia, or because they
were not 20% or more overweight. Absent members of this
group could not be tallied because of the lack of a
membership roster and because of the anonymity of the
people who attend.

Table 3.1   Group Membership of Sample

Group	n	% of Sample	Cumulative %
Group One	38	23.2	23.2
Group Two	12	7.5	30.5
Group Three	55	33.5	64.0
Group Four	24	14.6	78.7
Group Five	20	12.2	90.9
Group Six	15	9.1	100.0
Total	164	100.0	

Table 3.2   Age of Participants

Age in Years	n	% of Sample	Cumulative %
20-25	10	6.1	6.1
26-30	14	8.5	14.6
31-35	17	10.4	25.0
36-40	32	19.5	44.5
41-45	28	17.0	61.5
46-50	17	10.5	72.0
51-55	15	9.1	81.1
56-60	13	7.9	89.0
61-65	11	6.7	95.7
65-70	5	3.1	98.8
71-75	1	0.6	99.4
76-80	1	0.6	100.0
Total	164	100.0	

For the second group, 12 of the 16 people in attendance, or 75% completed the questionnaires. These 12 constituted 29.26% of the entire 41 local members.

For the third group, 55 participants constituted an unknown portion of the newsletter readers. The editor regularly distributed 500 to 600 copies of the newsletter, but spouses, friends, and relatives of staff members also have access to the newsletter; their participation was also solicited. If each newsletter reached an average of two people, the 55 participants represented approximately 9 to 11% of the total readership.

For the fourth group, the 24 participants represented 77.4% of the 31 members present and 61.5% of the 39 registered members.

Twenty members of group five constituted 83.3% of the 24 members present, and 80% of the 25 people enrolled in the class.

From the sixth group, 15 of the 21 people present participated, or 71.4%. This proportion represented 40.5% of the entire membership of 37.

Several sources of volunteers that were approached did not agree to participate in the study. Two national groups required the researcher to complete a formal application before their headquarters would decide whether to grant access to the membership. A local hospital and a health maintenance organization were also approached; they

required application to their research committee. Because
of the long time delays and the extensive paperwork
involved in potentially gaining access to these groups,
other more available groups were studied.

Age, Sex, and Race

The mean age of the sample was 43.7 years with a
standard deviation of 12.1. These ages ranged from 20 to
77 years. Frequencies and percentages of the various age
groups are presented in Table 3.2.

The majority of the sample were women, with 137
females comprising 83.5% of the sample. Twenty-seven of
the subjects were males, constituting 16.5%. These
frequencies and percentages are presented in Table 3.3.

The race of the sample was predominantly white, with
161 subjects or 98.2% reporting Caucasian heritage. One
subject reported she was Native American; one, Hispanic;
and one, Asian. These racial classifications are presented
in Table 3.4.

Education and Income

A wide range of educational levels was represented.
Six participants stated that they had completed Junior High
School, whereas three had doctoral level degrees. The mode
of the sample was comprised of 61 subjects who had earned a
high school diploma. More complete educational breakdowns
can be found in Table 3.5.

The income of the sample was also quite diverse, with

Table 3.3 Sex of Participants

Sex	n	% of Sample	Cumulative %
Female	137	83.5	83.5
Male	27	16.5	100.0
Total	164	100.0	

Table 3.4 Race of Participants

Race	n	% of Sample	Cumulative %
White	161	98.2	98.2
Black	0	0.0	98.2
Native American	1	0.6	98.8
Hispanic	1	0.6	99.4
Asian	1	0.6	100.0
Total	164	100.0	

Table 3.5 Education of Sample

Highest Educational Level Attained	n	% of Sample	Cumulative %
Elementary	0	0.0	0.0
Junior H.S.	6	3.7	3.7
Some H.S.	7	4.3	7.9
H.S. Degree	61	37.2	45.1
Some College	39	23.8	68.9
Technical Degree	16	9.8	78.7
Bachelor's Degree	25	15.2	93.9
Master's Degree	6	3.7	97.6
Doctoral Degree	3	1.8	99.4
Other	1	0.6	100.0
Total	164	100.0	

Table 3.6 Yearly Family Income of Sample

Income	n	% of Sample	Cumulative %
Under $10,000	10	6.1	6.1
$10,000-$19,999.99	29	17.7	23.8
$20,000-$29,999.99	40	24.4	48.2
$30,000-$49,999.99	61	37.2	85.4
$50,000-$74,999.99	15	9.1	94.5
$75,000-$99,999.99	6	3.7	98.2
$100,000-$149,999.99	1	0.6	98.8
$150,000-$199,999.99	0	0.0	98.8
$200,000 or More	2	1.2	100.0
Total	164	100.0	

ten subjects reporting a yearly income of less than $10,000
and two subjects claiming in excess of $200,000 per annum.
The modal category of family income was $30,000 to
$49,999.99 per year, with 61 subjects or 37.2% of the
sample reporting this figure. Table 3.6 contains more
complete information on the sample's income.

Percentage Overweight

The percentage overweight was calculated for each
subject based on that person's ideal weight for her or his
bone structure, height, and sex as recommended by the
Metropolitan Insurance Tables (see Appendix F). The
percentage overweight ranged from 20% to 198% with a mean
of 57.4% and a standard deviation of 35.4. This represents
a wide range of degree of obesity. A more extensive
breakdown of percentage overweight can be found in Table
3.7. It should be noted that one subject deleted this
item; therefore Table 3.7 is based on $\underline{N}$ = 163.

Age of Onset and Degree of Certainty

Participants were asked to estimate the age at which
they first became overweight, using the definition of
"overweight" as 20% over their ideal weight. They were
then asked to rate the degree of certainty they felt in
estimating their age of onset as very certain, fairly
certain, somewhat uncertain, and very uncertain (see
Appendix D). Ages of onset ranged from 1 to 64 years, with
a mean age of 17.6 and a standard deviation of 11.5.

Table 3.7 Percentage Overweight of Sample

Percentage Overweight	n	% of Sample	Cumulative %
20–30%	42	25.8	25.8
31–40%	24	14.7	40.5
41–50%	25	15.3	55.8
51–60%	11	6.8	62.6
61–70%	15	9.2	71.8
71–80%	12	7.3	79.1
81–90%	11	6.8	85.9
91–100%	7	4.3	90.2
101–110%	4	2.4	92.6
111–120%	2	1.3	93.9
121–130%	2	1.2	95.1
131–140%	1	0.6	95.7
141–150%	2	1.2	96.9
151–175%	3	1.9	98.8
176–200%	2	1.2	100.0
Total	163*	100.0	

*This item was omitted by one participant.

Table 3.8 Age of Onset of Obesity

Age of Onset	n	% of Sample	Cumulative %
1–5	21	12.8	12.8
6–10	35	21.3	34.1
11–15	32	19.6	53.7
16–20	19	11.5	65.2
21–25	22	13.5	78.7
26–30	16	9.7	88.4
31–35	8	4.9	93.3
36–40	6	3.7	97.0
41–45	2	1.2	98.2
46–50	2	1.2	99.4
51–55	0	0.0	99.4
56–60	0	0.0	99.4
61–65	1	0.6	100.0
Total	164	100.0	

Please see Table 3.8 for more detailed information on this
variable.

The degree of certainty of the onset age was skewed
with a greater proportion of respondents stating they were
very certain (48.2%) than any other category. Over
forty-three percent said they were fairly certain, making a
total of 91.5% in these two categories. Table 3.9 presents
a more detailed look at the degree of certainty of the
sample.

Stability of Weight

Participants were asked to rate how stable their
weight has been giving consideration (a) to the number of
times they have gained or lost weight and (b) to the amount
of weight they have gained and lost. Ratings which could
be given were (a) very stable, (b) somewhat stable,
(c) somewhat unstable, and (d) very unstable. The
distribution of these scores was slightly skewed with a
mean of 2.66 and a standard deviation of .93. Table 3.10
shows the distribution more clearly.

Dieting Status

Respondents were asked to state the length of time
they have been dieting. The largest proportion (41.5%)
stated they were not currently dieting; the second largest
group (29.9%) stated they have been dieting for over one
year, followed by the third largest group (10.4%) who
claimed to have been dieting for two to four weeks. A more

Table 3.9 Certainty of Age of Onset

Certainty	n	% of Sample	Cumulative %
Very Certain	79	48.2	48.2
Fairly Certain	71	43.3	91.5
Somewhat Uncertain	12	7.3	98.8
Very Uncertain	2	1.2	100.0
Total	164	100.0	

Table 3.10 Ratings of Stability of Weight

Stability Rating	n	% of Sample	Cumulative %
Very Stable	15	9.1	9.1
Somewhat Stable	63	38.4	47.6
Somewhat Unstable	49	29.9	77.4
Very Unstable	37	22.6	100.0
Total	164	100.0	

Table 3.11 Length of Time Dieting

Length of Diet	n	% of Sample	Cumulative %
Not Dieting	68	41.5	41.5
Under 1 Week	3	1.8	43.3
1 to 2 Weeks	8	4.9	48.2
2 to 4 Weeks	17	10.4	58.5
1 to 3 Months	8	4.9	63.4
3 to 6 Months	4	2.4	65.9
6 to 12 Months	7	4.3	70.1
Over 1 Year	49	29.9	100.0
Total	164	100.0	

detailed report of dieting status can be found in Table
3.11.

Operational Measures

Four self-report, paper-and-pencil instruments were
completed by the participants, the Eating Disorder
Inventory, the Weight Locus of Control Scale, Rotter's
Internal-External Locus of Control Scale, and the Personal
Data Sheet. Copies of each scale are found in Appendices A
through D respectively. They are described below.

Eating Disorder Inventory

The Eating Disorder Inventory (EDI) is a 64-item,
self-administered, forced choice instrument. It was
designed to measure eight psychological characteristics
commonly found among anorexic and bulimic patients; these
characteristics are the names of the subscales of the
instrument: Drive for Thinness, Bulimia, Body
Dissatisfaction, Perfectionism, Maturity Fears,
Interpersonal Distrust, Interoceptive Awareness, and
Ineffectiveness. According to Bruch (1973), the latter
three of these subscales are especially relevant to
obesity. Because of copyright laws, the entire instrument
was administered, but only the latter three subscales were
used in the present study. See Appendix A for a copy of
this instrument.

An example of an item that appears on the EDI is "I
eat when I am upset." The respondent rates how each item

applies to himself or herself on a 6-point Likert scale that ranges from "always" to "never". Items from each subscale are scored with three points given to an "always" answer, two points to a "usually" answer, one point to an "often" answer and zero points to any of the other responses. Some of these items are reverse scored. The entire instrument takes about twenty minutes to complete.

Subscales of the EDI are scored separately; there is no overall or total score. The Interpersonal Distrust Subscale has 7 items; therefore scores could range from 0 to 21. Higher scores indicate more deviance, in this case more interpersonal distrust. The mean score on this subscale for a group of 271 female normal weight (never bulimic and never anorexic) college students was 2.4. The standard deviation was 3.0. According to Garner and Olmsted (1984) this sample had scores not significantly different from a group of 18 female obese subjects, with the exception of Body Dissatisfaction scores which were significantly higher for the obese group.

There are ten items on the Interoceptive Awareness Subscale of the EDI; therefore scores on this subscale could range from 0 to 30. High scores indicate deviance, in this case the inability to read ones interoceptive cues. The mean score for the female college student norm group was 2.3 with a standard deviation of 3.6. One of the items on the Interoceptive Awareness Subscale was thought to be

inappropriate for the obese population. It read: "I feel
bloated after a normal meal." An item was added to the
scale to replace this item; it was included in an
Interoceptive Awareness-Revised Subscale: "I feel hungry
after a normal meal." The multiple regression analysis was
completed using both of these subscales. (See Appendix A,
items 47 and 65.)

The Ineffectiveness Subscale contains ten items;
scores could range from 0 to 30. Again, high scores
indicate deviance or a greater sense of ineffectiveness.
The mean score was 2.3 ($\underline{SD}$ = 3.8) for the norm group of
female college students.

Reliability. Subscales of the EDI were required to
have coefficients of internal consistency of at least .80
for the anorexic criterion group, using Standardized
Cronbach's alpha. For the normal-weight, non-bulimic
female comparison group, Cronbach alpha's were .66 on the
Interoceptive Awareness Subscale, .86 on the
Ineffectiveness Subscale, and .76 on the Interpersonal
Distrust Subscale. These three subscales were most
relevant to the current study. Their reliability data were
thought to apply to the obese population as well, because
Garner and Olmsted do not consider obesity as a psychiatric
disorder. Other subscales ranged in coefficients from .65
on Maturity Fears to .91 on Body Dissatisfaction.
Correlations were higher for the anorexic sample, ranging

from .82 on Perfectionism to .90 on Bulimia, Body
Dissatisfaction, and Ineffectiveness.

Item-scale correlation coefficients were considered
acceptable if they were above .40 for the anorexic
criterion group. The average item-total correlation was
.63 on the anorexic criterion group across all subscales.
For the female comparison group, item-subscale correlations
averaged .61 on Ineffectiveness, .53 on Interpersonal
Distrust, and .49 on Interoceptive Awareness. These
correlations indicate substantial within-scale common
variances.

Response Bias. To examine the possible effects of
response set bias, the mean subtotal of all positively
keyed items was compared with the mean subtotal of all
negatively keyed items. This correlation of .67 (p < .001)
for the female comparison group suggests minimal response
set bias.

Validity. Criterion validity was established by the
EDI authors in several stages. One method was to determine
the agreement between clinicians' ratings of a subgroup of
49 anorexic patients on each of the subscales and their
actual EDI scores on those subscales. These raters were
psychiatrists and psychologists who were either primary
therapists or consultants familiar with the patient's
background. Correlations ranged from .43 to .57; all were
significant at the p < .001 level. This study indicates

agreement between therapist ratings and the self-report subscale scores.

Garner, Olmsted, and Polivy (1983) also used a discriminant function analysis to determine the percent of anorexic and female control subjects classified correctly by using each of the EDI subscales. Percentages ranged from 87.6% on Body Dissatisfaction to 93.1% on Interoceptive Awareness.

Criterion-related validity was demonstrated for some subscales by showing that comparison groups scored in a theoretically expected manner. Using one-way ANOVA and planned t-tests, Garner et al. found that bulimic-type anorexic patients scored significantly higher than restricter-type anorexic patients on Bulimia and Body Dissatisfaction subscales (p < .01). A bulimia-only group (anorexia was not present) had elevated Body Dissatisfaction, Bulimia, and Drive for Thinness Subscales; as expected, they were not significantly different from bulimic-type anorexic patients on these measures.

Obese groups (OB) and formerly obese (FOB) groups also performed in a theoretically consistent manner. The OB group had significantly higher Body Dissatisfaction scores (p < .001) than the FOB group, and higher scores on Bulimia and Drive for Thinness than the normal-weight female comparison (FC) group. The OB and FOB groups were not significantly different from the FC group on measures

of Ineffectiveness, Interpersonal Distrust, or
Perfectionism.

Because some of the EDI subscales are similar to other
published psychological instruments, convergent and
discriminant validity were assessed. Interpersonal
Distrust was most closely related to the Beck Depression
Inventory with r = .52 (BDI, Beck, 1978) whereas
Ineffectiveness correlated most strongly with both the BDI
(r = .75) and with the Feelings of Inadequacy Scale
(r = .73) of Janis and Field (1959). Interoceptive
Awareness correlated most strongly with the BDI (r = .63),
and the Hopkins Symptom Check List (r = .63), a measure of
somatization, obsessionality, anxiety, depression, and
interpersonal sensitivity (Derogatis, Lipman, Rickels,
Uhlenhuth, and Covi, 1974).

Scale Advantages and Limitations. Many of the
disadvantages of the EDI are a function of its infancy as
an instrument. There are not as many validation studies as
for an older instrument such as the MMPI. Reliability data
demonstrate good internal consistency (Cronbach's
alpha $\geq$ .80 for all subscales) but these data have been
demonstrated as generalizable only to a young female
population. Similarly, validity studies are convincing but
limited to generalizations about young females.

These drawbacks also provide a major rationale for
using the instrument. It is a promising instrument that

warrants further investigation into its reliability;
expansion of its normative data to include obese subjects
of a wider age range would make it more useful.

Another major advantage to utilizing this instrument
is that its subscales correspond well to a major
theoretical position (Bruch, 1973). The items are specific
to eating disorders, and frequently refer to eating and
weight, rather than global, non-specific contexts.
Alternate measures of the constructs are problematic.
Other measures of interoceptive awareness are unavailable.
While measures of distrust are readily available, the
construct is typically utilized with alternate meanings,
for example, pessimism regarding the future, which is not
congruent with Bruch's definition.

Discussion of EDI. It is interesting that the authors
of the EDI carefully describe the anorexic population as a
heterogeneous group:

> Within clinical populations, the EDI may be
> useful in identifying subtypes of anorexia
> nervosa. Delineation and more precise
> measurement of psychological traits
> differentiating subgroups may have relevance to
> the understanding and the treatment of anorexia
> nervosa and bulimia. Considering the
> multidimensional nature of these disorders and
> the large amount of psychological variability
> across the heterogeneous patient population, the
> EDI profile of a particular patient may provide
> the therapist with valuable clinical information
> relevant to treatment (Garner and Olmsted, 1983,
> p. 10).

Many of the EDI subscales are based on the theoretical
writings of Hilde Bruch. Yet when Garner and Olmsted

report their findings on an obese sample, they appear to
have overlooked Bruch's writings on this disorder:

> The EDI was administered to a group of 18 female
> obese (120% or more of expected weight for age
> and height) subjects who were an average of 135%
> of average weight ($\underline{SD}$ = 18.4%). The obese group
> had Body Dissatisfaction scores which were higher
> than those for anorexia nervosa patients.
> However, on all other EDI subscales the obese
> group had low mean scores, within the range for
> female college students. This pattern of EDI
> scores suggests that the obese group had low mean
> scores, within the range for female college
> students. This pattern of EDI scores suggests
> that the obese group does not share the
> psychological disturbances which characterize
> anorexia nervosa. This interpretation is
> consistent with the DSM III (American Psychiatric
> Association, 1980) determination that obesity is
> not a psychiatric disorder (Garner and Olmsted,
> 1983, p. 19).

It seems ironic that researchers who developed an
instrument to help delineate anorexic subgroups, utilizing
Bruch's writings as a base, ignore her similar observations
that obesity is a heterogeneous disorder. A sample size of
18 cannot easily differentiate obesity subgroups even if
the researchers had considered age at onset. Although
Garner and Olmsted do not state the sample's ages, if the
participants were selected to match the college age
students of previous criterion and comparison groups, it is
likely that most of the sample would have childhood-onset
obesity, because of their limited number of years as
adults. It would be interesting to determine what
subgroups could be delineated from a larger and more varied
group of obese subjects by utilizing the EDI. Use of this

instrument in the present study will help address this problem, and it will help assess the usefulness of the EDI with the obese population.

Weight Locus of Control Scale

The Weight Locus of Control Scale (WLOC) is a short, four-item objective instrument that was designed to measure locus of control specifically as the construct applies to weight. The WLOC Scale consists of two internally worded items and two externally worded items, each of which is rated on a 6-point Likert scale. Scores range from 1 point for strongly disagree to 6 points for strongly agree on the externally worded items. The internally worded items are reverse scored. Thus, the possible range for the scale is 4 to 24, with a score of 4 being very internal and a score of 24 being very external. Subjects on whom the scale was normed scored in the internal direction. College undergraduates from the test-retest reliability study ($\underline{N}$ = 115) had mean scores of 7.74 ($\underline{SD}$ = 3.24) and 8.19 ($\underline{SD}$ = 3.05). A self-selected group of women ($\underline{N}$ = 115) choosing to begin a weight control program were even more internal ($\underline{M}$ = 7.04, $\underline{SD}$ = 2.79). Saltzer (1982) suggests that people who choose weight control programs may be indicating a belief in their own control of a bodily function. Thus, it is reasonable that they would score in the internal direction. A similar case could be made for young people who choose to control the direction of

their lives via education, although their internality would be a general, non-specific to weight, locus of control. See Appendix B for a copy of this instrument.

Reliability. Saltzer (1982) tested 110 college undergraduates from an introductory social science course to determine scale internal consistency and test-retest reliability. The test was administered twice to this group with a 24 day time delay between administrations. The test-retest reliability coefficient equaled .657 (p < .001, N = 110). Cronbach's alpha equaled .58 for the first administration (N = 113) and .56 for the second administration (N = 112). Although the measures of internal consistency are somewhat low (r = .56 and r = .58), the small number of items, the moderate range in scores, and the homogeneity of the sample (they were similar in age and education, and had coursework overlap) would all serve to depress this coefficient (Anastasi, 1976).

Validity. Regarding discriminant validity, Campbell and Fiske (1959) recommend that a new instrument not correlate too highly with previous measures from which it is supposed to differ. Accordingly, the WLOC Scale had modest but significant correlations with Rotter's I-E Scale (r = .32, p < .001), with Wallston's et. al. (1976) Health Locus of Control Scale (r = .21, p < .02) and with two of the three scales of the Wallston, Wallston, and DeVelle's

(1978) Multidimensional Health Locus of Control Scale (MHLOC). On the MHLOC three subscales include the Internal Health Locus of Control Scale (r = -.30, p < .001), the Chance Health Locus of Control Scale (r = .35, p < .001) and the Powerful Others Health Locus of Control Scale (r = .11, p > .05). These results suggest that the WLOC Scale is measuring a dimension related to but not identical with the earlier measures. The only scale with which the WLOC Scale was not significantly correleted was the Powerful Others Health Locus of Control Scale; the finding is not surprising because there are no items on the WLOC Scale which measure this dimension of externality (Saltzer, 1982).

Data were also collected on the WLOC Scale to determine whether it is biased by a social desirability response set. Accordingly, scores were correlated with results from the Crowne-Marlowe Social Desirability Scale (1960). Lack of significant correlation (r = -.03) suggests that no bias in response set occurred.

Two further validations studies support the predictive validity of the WLOC Scale. Saltzer (1978) found, as hypothesized, that subjects who were internal on the WLOC Scale and who highly valued (a) health or (b) physical appearance were strongly influenced by their personal attitudes in their behavioral intentions for weight loss (B = .91, p < .001 and B = .53, p < .005, respectively).

When values were high on both health and physical appearance, the correlation between internality and influence of personal attitudes was also significant ($\underline{B}$ = .69, $\underline{p}$ < .025). In contrast, WLOC externals were more strongly influenced by perceived social pressure (as measured by a questionnaire designed by Saltzer), given that they valued health ($\underline{B}$ = .58, $\underline{p}$ < .005), physical appearance ($\underline{B}$ = .54, $\underline{p}$ < .01) or both health and physical appearance ($\underline{B}$ = .80, $\underline{p}$ < .005). The same pattern did not occur when locus of control was assessed using the Rotter I-E Scale. This finding suggests that the WLOC more specifically assesses the construct in a way that is relevant to weight-related research.

In a second validation study Saltzer (1982) hypothesized that WLOC internals who placed a high value on weight loss would be more likely to complete and succeed at a six-week weight reduction program. Using a point-biserial correlation to assess results, Saltzer found that WLOC Scale internals were significantly more likely to complete the program than were externals ($\underline{r}$ = -.20, $\underline{p}$ < .02). Regarding weight loss, the relationship for internals between actual behavior and intended behavior ($\underline{r}$ = .56, $\underline{p}$ < .001) was stronger than the same relationship for externals ($\underline{r}$ = .17, $\underline{p}$ > .05), but the difference between these correlations was not significant ($\underline{z}$ = 1.9, $\underline{p}$ < .06). However, when the value placed on health or

on physical appearance was considered, the correlations became significantly different ($p < .05$). Thus, WLOC internals who placed a high value on health or physical appearance were significantly more likely to successfully complete this six-week weight-control program than were WLOC externals with similar values. Other measures of locus of control did not have the same predictive ability. Saltzer again speculated that the reason for this difference was that the other measures were not specific enough.

Scale Advantages and Limitations. One limitation of the WLOC Scale is its somewhat low Cronbach's alpha reliability coefficients ($r = .58$, and $r = .56$). This measure of internal consistency may well reflect the fact that the test has only four items or that the sample tested was homogeneous. Both of these factors would serve to depress the internal consistency (Anastasi, 1976). Cronbach's alpha was computed on the sample selected for the current study to add to the instrument's reliability data. This information will be presented in Chapter IV.

A major advantage of the WLOC Scale is its specificity to the weight domain. Previous criticisms of the construct of locus of control have focused primarily on its generality and inability to predict behavior within a specific context (Mirels, 1970; Saltzer, 1978). The WLOC Scale is the most specific measure of locus of control for

the context of the present study.

Another advantage of the WLOC Scale is its adequate test-retest reliability. Validity findings are also promising on this instrument.

Rotter's Internal-External Locus of Control Scale

The Internal-External Locus of Control Scale (I-E) is a 29-item self-report Likert-style questionnaire that was developed by Rotter (1966) to measure the extent to which an individual believes that reinforcements are contingent upon personal behavior or characteristics. People with an internal locus of control, also called "internals", believe that events are under the control of their own behavior or characteristics. "Externals", individuals with an external locus of control, believe that outside forces such as fate, luck, chance, or powerful others control environmental rewards. This construct is conceptualized as varying along a continuum; it is not a dichotomy. The I-E Scale is a global measure of locus of control, in contrast to other specific measures such as the Weight Locus of Control Scale, which measures locus of control within a particular domain. The scale was designed to measure a general expectancy for control; thus, one would expect that it would predict moderately well across situations but less well within a specific context.

The instrument consists of 23 externally weighted items and 6 neutral "filler" or unscored items. The

instrument is scored by adding one point for each externally weighted item. Thus, extremely external individuals could score as high as 23. Extremely internal individuals could score as low as zero.

Normative data is also reported by Rotter (1966). He combined the means from a variety of samples ($\underline{N}$ = 4,433) to obtain a total mean of 8.3 ($\underline{SD}$ = 3.9); for females, the mean was 8.5 ($\underline{SD}$ = 3.9) and for males, the mean was 8.2 ($\underline{SD}$ = 4.0). A copy of the scale is printed in Appendix C.

Reliability. Rotter (1966) assessed the test-retest reliability of the I-E Scale on a group of sixty undergraduate psychology students with a one-month time period between administrations. He found a coefficient of .72. A second sample with a two-month time delay between testings produced a .55 coefficient. The longer time delay and the individual administrations (in contrast to group administrations on the first study) may account for the discrepant findings. Jessor (cited in Rotter, 1966) tested and retested 28 male prison inmates at a one-month interval; he obtained a .78 reliability coefficient.

Rotter also reported several measures of internal consistency. On a sample of 50 male and 60 female psychology students, he calculated Spearman-Brown coefficients of .65 and .79 respectively, with a coefficient on the combined sample of .73. Spearman-Brown is a split-half coefficient that, according to Rotter, may

underestimate the reliabiltiy of his instrument, because the items are not arranged in a hierarchy of difficulty. Rather, the items sample beliefs about a variety of situations; this characteristic makes the questions less homogeneous. Heterogeneity also affects Kuder-Richardson coefficients of interitem consistency. On the same sample, Rotter calculated a .73 coefficient for the combined male and female subjects. On a second study of 400 psychology students (50% were of each sex), the Kuder-Richardson coefficient was .70. Similarly, Franklin (1963) found a Kuder-Richardson coefficient of .69 on his Purdue Opinion Poll sample of high school students. While these reliability coefficients are not unusually high, they are similar to those obtained for most personality measures.

Social Desirability. Rotter (1966) reviewed studies that assessed the tendency of respondents to answer questions in a socially desirable manner. He found correlations between the Marlowe-Crowne Social Desirability Scale and the I-E Scale that ranged between r = -.07 to r = -.35. These findings suggest that under some circumstances, scores on the I-E Scale may reflect the desire to appear socially acceptable. Other researchers have confirmed these findings (Cone, 1971; Hjelle, 1971; Vuchinich & Bass, 1974).

Validity. The validity of the I-E Scale has been fairly well established. One method of verification is to

compare I-E scores with other measures of the same construct. Cardi (1962) interviewed and rated subjects on their perceived locus of control regarding academic achievement. These ratings correlated significantly and positively with I-E scores. Artwohl (1979) found, as hypothesized, that internal subjects had significantly higher Ego Strength Scale scores on the Minnesota Multiphasic Personality Inventory. This finding supports I-E scale validity, because ego strength can be described as ability and competence to cope with the environment, a construct that overlaps with internality. Adams-Webber (1963) assessed internality through a story completion task and found that his ratings correlated significantly with I-E scores. The quantity of research supporting the construct validity of the I-E scale is extensive. Numerous reviews cover this topic in more depth (Joe, 1971; Lefcourt, 1976; Phares, 1976; Prociuk & Lessier, 1975; Throop & MacDonald, 1971).

To be valid, a scale needs to not measure constructs from which it is supposed to differ. Rotter (1966) claims that the I-E Scale has good discriminant validity. It distinguishes between what it is supposed to measure and other constructs, such as intelligence, social desirability and need for approval.

Numerous studies have compared the behavior of "internal" subjects to that of "external" subjects. Only a

small sample are included here.   A median split is
typically used to categorize subjects.   Seeman and Evans
(cited in Rotter, 1966) found that internal tuberculosis
patients were significantly more questioning of hospital
staff, more knowledgeable about their condition, and less
satisfied about the amount of information they received
from staff than externally oriented patients.   The
researchers concluded that this "need to know" reflected
their belief that they could do something about their
condition.

Weiss (1977) found that locus of control was a
significant predictor variable for successful weight
reduction.   As hypothesized, internal subjects were more
able to control their weight.   Other studies suggest that
locus of control is not specific enough to predict behavior
in one domain (Tobias and MacDonald, 1977, and Saltzer,
1982).   These studies were reviewed in Chapter II and will
not be repeated here.   Phares (1965) studied the
persuasiveness of internal subjects.   As predicted, they
were significantly more able to change the attitudes of
other people than were external subjects.   In all three of
these studies the subjects' belief that they can control
the environment translated into more effective behavior in
that environment.   These findings support the validity of
the I-E scale.

Other studies have not been supportive of the

predictive validity of the instrument. Lack of clearcut

findings has raised issues regarding the specificity versus

the generality of locus of control as a construct.

Researchers have argued over whether it should be a

unidimensional or a multidimensional construct. Numerous

researchers have developed scales that either break down

locus of control into components or study it within one

context.

Scale Advantages and Limitations. The I-E Scale has

several disadvantages that were not considered problematic

for the purposes of this study. (a) It was normed on a

college sample. However, the extensiveness of its use

elsewhere has broadened its external validity. (b) It does

not discriminate among subjects within a homogeneous sample

(Rotter, 1966). This disadvantage was not considered

problematic for the heterogeneous obese population.

(c) On eight of the items males respond significantly

different from females (Strickland and Haley, 1980).

Because most participants in the present study were female,

this drawback was not troublesome. Sex differences were

also controlled in the analysis of data. (d) The I-E Scale

is a global measure that may not be specific to the

weight-control domain. Because the present study was not

a treatment study, but a theoretical one, the global

measures of ineffectiveness were thought to be relevant

to Bruch's theory. A second measure, the WLOC, was

utilized to assess global/specific locus of control differences. (e) The scale may be subject to a social desirability response bias. This risk was reduced by careful instructions to research participants, stressing that there were no right or wrong answers and that honesty would be most helpful in producing a better understanding of the topic. Assurance of confidentiality and anonymity should also have served to reduce bias (Carlson, 1971).

Advantages of including the instrument are its establishment as a standard instrument. Because of this characteristic, results can be readily compared to other studies. Reliability data is adequate and validity is good. It is an accurate measure of the constructs relevant to this study.

Personal Data Sheet

The personal data sheet is a 21-item self-report instrument designed by the author to gather demographic data on the participants. It was used to assess degree of overweight (based on height, sex and bone structure), stability of weight, rank among siblings in the family of origin, group membership, dieting status, age of onset of obesity, sex, age, educational level, income, race, and existence of a stressor prior to initial weight gain. It was reviewed by a pilot group of 10 obese subjects to make changes before administering it to the research participants. Several items (numbered 20, 21, and 22) were added to the instrument to collect data for future

research; they are not relevant to the present study. See
Appendix D for a copy of the data sheet.

Design

This study was a descriptive one in which several
independent variables were examined to determine their
degree of correlation with five dependent variables. These
dependent variables, assessed by the instruments previously
described, include interoceptive awareness, interpersonal
distrust, ineffectiveness, general locus of control, and
weight locus of control. The primary independent variable
of interest is age of onset of obesity. Other independent
measures were monitored because (a) they may act as
confounding variables or (b) they are known to vary with
the prevalence of obesity. These secondary independent
variables include certainty of age of onset, age, weight
stability, percentage overweight, dieting status, sex,
education, and income.

Multiple regression was utilized to determine what
percentage of variance the predictor variables (age of
onset, certainty of age of onset, age, weight stability,
percentage overweight, dieting status, sex, education, and
income) accounted for in the dependent variables
(interoceptive awareness, interpersonal distrust,
ineffectiveness, locus of control, and weight locus of
control.) The equations for the design are represented in
Figure 3.1.

Another design was utilized for two secondary

$$Y_1 = a + b_1X_1 + b_2X_2 + \ldots + b_9X_9$$

$$Y_2 = a + b_1X_1 + b_2X_2 + \ldots + b_9X_9$$

$$Y_3 = a + b_1X_1 + b_2X_2 + \ldots + b_9X_9$$

$$Y_4 = a + b_1X_1 + b_2X_2 + \ldots + b_9X_9$$

$$Y_5 = a + b_1X_1 + b_2X_2 + \ldots + b_9X_9$$

Y_1 = Ineffectiveness Score

Y_2 = Interpersonal Distrust Score

Y_3 = Interoceptive Awareness Score

Y_4 = Locus of Control Score

Y_5 = Weight Locus of Control Score

X_1 = Age of Onset

X_2 = Certainty of Age of Onset

X_3 = Age

X_4 = Weight Stability

X_5 = Percentage Overweight

X_6 = Dieting Status

X_7 = Sex

X_8 = Education

X_9 = Income

Figure 3.1 Multiple Regression Design

hypotheses. To determine the relationship between a dichotomous variable (presence of stress at time of obesity onset versus absence of stress) and a continuous variable (age of onset of the obesity), a point-biserial correlation was used. A representation of the design is shown in Figure 3.2. A similar design was used for the latter of the secondary hypotheses in which age of onset was again the continuous variable. For this hypothesis, however, rank among siblings was the dichotomous variable, with (a) only or youngest and (b) other position as the two variables.

Item-scale reliability coefficients (Cronbach's alpha) were also computed on the WLOC and on relevant subscales of the EDI to demonstrate the reliability of both instruments on this sample.

Data Collection Procedures

Prior to beginning the study, its procedures, instruments, and consent form were approved by the Michigan State University Human Subjects Review Board. A pilot group of ten obese subjects reviewed and completed the test packet in order to provide the researcher with feedback about unclear items; appropriate revisions were then made.

Obese individuals from a variety of sources were then approached to determine their interest in participating in the research. As previously stated, several national groups conduct their own research; they required extensive screening, paperwork, meetings, and delays prior to letting
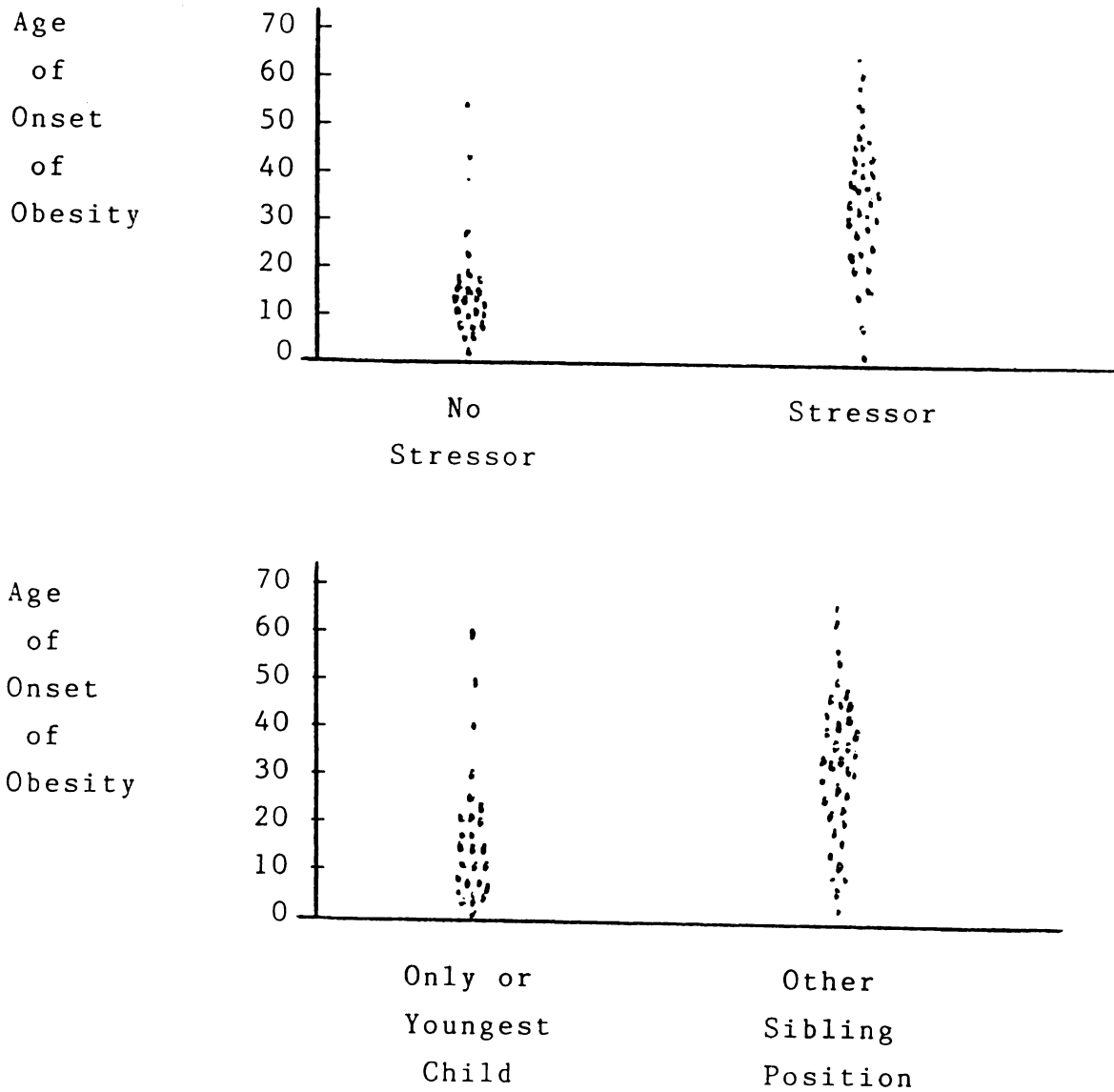
Figure 3.2 Point-Biserial Design

outside researchers possibly have access to their population. It was necessary to utilize more accessable groups, six of which agreed to participate.

After contacting the group leader by telephone and explaining the research verbally, a letter was sent to the group explaining the research, its purposes, and general procedures. (See Appendix E for a sample copy of the letter.) A height and weight chart was included with the letter to help participants determine their eligibility (see Appendix F). A time and place was suggested to each group in the letter; it had been previously negotiated with the leader and was later finalized with her.

The researcher was present at the designated times for data collection. The purpose of the study was re-explained; questions and concerns were addressed. Persons with a history of anorexia nervosa or bulimia were excluded from the study, as were persons who were less than 20% overweight. The information and consent form was explained to the participants; they were then asked to sign it, add their addresses if they wished a copy of the general results of the study, detach it from the packet of test materials, and return it to the examiner so that their responses would remain anonymous (see Appendix G). Participants were requested to answer all questions, to work independently with full respect for each other's confidentiality, to be as honest as possible, and to ask the researcher for assistance if they had any questions or

difficulty. They were assured that there were no right or wrong answers and that their anonymity would be protected. They were told that only aggregate data would be reported in the dissertation and in any publications so that individual identities would be safeguarded. They were also informed verbally and in writing that they would be free to discontinue their participation at any time without censure or pressure to continue.

After the administration of the instruments the researcher remained after the study to offer debriefing, to answer questions, and to address concerns. A list of local psychological referrals was kept on hand in case any subjects experienced adverse reactions. As expected, there were no apparent or reported adverse reactions to the study, and no psychological referrals were made. Few individuals took advantage of the debriefing time, although numerous participants remained to chat informally about their dieting attempts, their group, or other issues.

Within approximately two weeks of each group's participation, an informal thank you note was sent to those group's leaders who were willing to provide their last names and addresses. After data analysis was completed, a thank you letter and summary of the results of the study were sent to those 123 participants who requested one (see Appendix H).

Testable Hypotheses

The statistical hypotheses listed below were tested

with a one-tailed test for significance (alpha = .05).
Theoretical writings allow for directional tests, and this
decision was made in consistency with reported clinical
experience. All hypotheses are stated in the predicted
form.

Primary Hypotheses

1. Obese adults with earlier ages of onset of obesity
will demonstrate higher levels of ineffectiveness (higher
scores on the Ineffectiveness Subscale of the EDI) than
obese adults with later ages of onset, when the effects of
eight potentially confounding variables are controlled
(i.e., certainty of age of onset, age, weight stability,
percentage overweight, dieting status, sex, education, and
income).

$$H_1: \underline{R}^2 > 0$$

2. Obese adults with earlier ages of onset of obesity
will demonstrate higher levels of interpersonal distrust
(higher scores on the Interpersonal Distrust Subscale of
the EDI) than obese adults with later ages of onset, when
the effects of eight potentially confounding variables are
controlled (i.e., certainty of age of onset, age, weight
stability, percentage overweight, dieting status, sex,
education, and income).

$$H_2: \underline{R}^2 > 0$$

3. Obese adults with earlier ages of onset of obesity
will demonstrate less interoceptive awareness (higher
scores on the Interoceptive Awareness Subscale of the EDI)

than obese adults with later ages of onset, when the
effects of eight potentially confounding variables are
controlled (i.e., certainty of age of onset, age, weight
stability, percentage overweight, dieting status, sex,
education, and income).

H_3: $\underline{R}^2 > 0$

4. Obese adults with earlier ages of onset of obesity
will demonstrate more external locus of control (higher
scores on Rotter's I-E Scale) than obese adults with later
ages of onset, when the effects of eight potentially
confounding variables are controlled (i.e., certainty of
age of onset, age, weight stability, percentage overweight,
dieting status, sex, education, and income).

H_4: $\underline{R}^2 > 0$

5. Obese adults with earlier ages on onset of obesity
will demonstrate more external weight locus of control
(higher scores on the WLOC Scale) than obese adults with
later ages on onset, when the effects of eight potentially
confounding variables are controlled (i.e., certainty of
age of onset, age, weight stability, percentage overweight,
dieting status, sex, education, and income).

H_5: $\underline{R}^2 > 0$

Secondary Hypotheses

6. Obese adults with earlier ages of onset will be
more likely to have been only or youngest children in their
families of origin than obese adults with later ages of
onset.

H_6: $\underline{r} > 0$

7. Obese adults with earlier ages of onset will be less likely to report the occurrence of a stressor prior to or at the time of initial weight gain than will obese adults with later ages of onset.

H_7: $\underline{r} > 0$

Analysis

Hierarchical multiple regression was chosen as the analysis procedure for the five primary hypotheses of this study (see Figure 3.1). Regression is an appropriate statistical tool when one has a quantitative dependent variable and several quantitative or dichotomous independent variables. It is especially useful in descriptive research where confounding or interacting variables need to be controlled statistically rather than through a tight experimental procedure.

Advantages of using multiple regression are numerous. (a) It can utilize age of onset as a continuous variable, rather than breaking it down into categories, as an ANOVA procedure would require. Thus, it retains information that other procedures lose. (b) The hierarchical procedure allows for control of confounding variables and analysis of their effect on $\underline{R}^2$, the proportion of variance accounted for by the regression equation; this condition is necessary in a complex disorder such as obesity where numerous variables interact. The procedure also has the advantage that these variables can be dichotomous or quantitative.

(c) Multiple regression does not require equal cell sizes like ANOVA. This was an important consideration because of unequal cell sizes per age of onset unit. (d) The test is highly robust, in that violation of normal distribution and other underlying assumptions can be tolerated (Binder, 1959; Boneau, 1960; Cochran, 1947; Donaldson, 1968, cited in Cohen & Cohen, 1975).

To analyze significance, an alpha = .05 one-tailed test was established. Cohen, (1965, 1969) suggests a conventional power of 1-$\underline{B}$ = .80, which is the level chosen here. To demonstrate a moderately small effect size of $\underline{R}$ = .10, with nine predictor variables, a sample size of 144 is necessary (Cohen and Cohen, 1975). To exceed this criteria and yet allow for drop-outs or incomplete data, a sample size of 164 was considered as more than adequate for this study.

The secondary hypotheses of this study were analyzed using a point-biserial correlation coefficient. This method is appropriate when one has a continuous variable (age of onset) and a categorical variable (rank among siblings and existence of a pre-obesity stressor, for hypotheses 6 and 7 respectively). Rank among siblings was assessed as a dichotomy: (a) was the person an only or youngest child or (b) did the person hold another position? A major advantage of point-biserial correlation, in contrast to other types of measures, is that it allows the age of onset variable to remain continuous. Thus the full

information provided is retained.

As previously stated, the researcher also computed a Cronbach's alpha reliability coefficient on the WLOC Scale to determine its internal consistency. This coefficient is appropriate for use on instruments such as the WLOC that measure item answers on a Likert scale. Additional Cronbach's alpha reliability measures were calculated on the three EDI subscales relevant to this study. These calculations were made to determine whether the instrument's reliability on this sample was similar to other reported samples, to add to the existing literature on the reliability of the instrument, and to facilitate interpretation of this research.

Summary

A sample of 164 obese adults from an urban area in the midwestern United States was studied to determine the relationship between the age of onset of their obesity (as well as other demographic variables) and several dependent variables. The participants completed a personal data sheet which provided information on age, sex, percentage overweight, age of onset of obesity, income, education, dieting status, and stability of weight. These variables were used as predictor variables in a hierarchical multiple regression design to determine what percentage of the variance they could account for in several dependent variables. Tests used to measure the dependent variables were the Weight Locus of Control Scale and Rotter's I-E

Scale (measures of weight-specific and general locus of control) and the Ineffectiveness, Interpersonal Distrust, and Interoceptive Awareness Subscales of the Eating Disorder Inventory.

Secondary hypotheses were tested using a point-biserial design. The researcher tested the relationship between (a) age of onset and the existence of a stressor at the time of onset and (b) age of onset and rank among siblings. Two ranks among siblings were considered as the dichotomy (a) youngest or only, and (b) other position. Analysis of the data will be covered in Chapter IV.

CHAPTER IV

ANALYSIS OF THE DATA

In Chapter IV an analysis of the data collected in
this research will be presented. Reliability coefficients
of the Weight Locus of Control Scale (WLOC) and three
subscales of the Eating Disorder Inventory (EDI) will be
discussed first, followed by some discriminant validity
data. Differences between the groups will be reported
next; then, formal hypothesis test results, together with
some extra analyses. The chapter will conclude with an
overall summary.

Reliability and Validity

The internal consistency of the WLOC Scale and the
three relevant subscales of the EDI (Interoceptive
Awareness, Interpersonal Distrust, and Ineffectiveness)
were calculated using Cronbach's alpha. Correlations were
acceptable for all four measures.

A reliability coefficient of .47 was found for the
WLOC Scale. This is somewhat lower than Saltzer's reported
coefficients of .56 and .58 (1982). The small number of
items and the homogeneity of the sample with regard to
obesity might both have served to depress this coefficient
(Anastasi, 1976).

The EDI subtests fared more moderately on measures of
reliability. The internal consistency coefficient of the
Interoceptive Awareness Subscale equaled .71. This is
higher than coefficients reported by Garner and Olmsted of

108

.66 for a normal-weight non-bulimic sample (1984). The
Interpersonal Distrust Subscale had a coefficient of .83, a
slight increase over Garner and Olmsted's reported
coefficient of .76. The coefficients for the
Ineffectiveness Subscale were also similar but slightly
lower, with r = .77 for this study and r = .86 for the
Garner and Olmsted sample.

A measure of validity on the WLOC Scale was also
calculated. When assessing discriminant validity, Campbell
and Fiske (1959) recommend that a new instrument not
correlate too highly with previous measures from which it
is supposed to differ. Accordingly, the WLOC scale had a
modest but significant correlation with Rotter's I-E Scale
(r = .30, p < .001). See Appendix I for a complete Pearson
product-moment correlational matrix.

Normative Data

Overall, this obese sample scored similarly to
normal-weight norm groups on all measures. On LOC, they
had a mean score of 8.13 (SD = 3.90) in comparison to
Rotter's (1966) combined mean from several studies of 8.3
(SD = 3.54). Similarly, on the EDI, the obese sample
scored much more closely to the normal-weight controls than
to anorexic or bulimic subjects. On the Interpersonal
Distrust Scale, this sample had a mean of 2.80 (SD = 3.02)
in comparison to Garner and Olmsted's (1984) female
anorexic patients (M = 6.4, SD = 4.9), and their female
normal-weight controls (M = 2.4, SD = 3.0). On the

Interoceptive Awareness Scale, this sample had a mean of 4.19 ($\underline{SD}$ = 4.52) in comparison with Garner and Olmsted's anorexic patients ($\underline{M}$ = 11.4, $\underline{SD}$ = 7.0) and normal-weight controls ($\underline{M}$ = 2.3, $\underline{SD}$ =3.6). A mean of 3.74 ($\underline{SD}$ = 4.45) was calculated on the Ineffectiveness Subscale for this sample, in contrast to Garner and Olmsted's reported means of 12.1 ($\underline{SD}$ = 8.6) and 2.3 ($\underline{SD}$ = 3.8) for the anorexic and the control groups, respectively. On the WLOC they had a mean of 8.06 ($\underline{SD}$ = 3.34) in comparison to Salter's (1982) reported means which ranged between 7.04 ($\underline{SD}$ = 2.79) and 8.19 ($\underline{SD}$ = 3.05). Thus, they appear to be a heterogeneous group who scored similarly to the normal population.

Differences Between Groups

Because of the large sample size required to calculate multiple regression, because of the desire to maximize the range of differences among participants on the independent variables, and because of practical considerations such as availability, the sample was selected from six weight-related groups. This variable, group membership, was not a quantitative variable, nor one with a sensible order to it. Thus, its effect on the dependent variables could not be analyzed or controlled by multiple regression. It was therefore important to look at significant differences among these groups.

The first step in determining between-group differences was to run an ANOVA or Chi Square on each of the variables of interest; it was necessary to use ANOVA on

quantitative variables and Chi Square on categorical

variables. These tests measure global between-group

differences; they do not point to specific deviant groups.

Pairwise differences between groups can be calculated for

the quantitative variables only after demonstrating a

significant omnibus $\underline{F}$ on the ANOVA. A post hoc analysis

compares each group mean on the variable of interest with

every other group mean. Rather than calculating multiple

t-tests, a procedure which would have magnified the

likelihood of getting a Type II error, the Scheffe formula

was used. This is a post hoc test that makes multiple

comparisons, appropriate when there are no predicted

hypotheses.

Variables Demonstrating No Between-Group Differences

Using ANOVA and a two-tailed test with alpha = .05,

the groups were found not to be significantly different on

the following independent variables: education,

$\underline{F}$ (5, 158) = 2.207, $\underline{p}$ = .0562; certainty of age of onset,

$\underline{F}$ (5, 158) = 2.054, $\underline{p}$ = .074; and stability of weight,

$\underline{F}$ (5, 158) = 2.014, $\underline{p}$ = .0794. Groups were not

significantly different on one dependent variable, locus of

control, $\underline{F}$ (5, 158) = 2.118, $\underline{p}$ = .066. Because sex is a

categorical variable, the Chi Square Analysis with

alpha = .05 was used to determine that there were no

significant between-group differences on this variable, Chi

Square (5, $\underline{N}$ = 164) = 2.44, $\underline{p}$ = .79. Differences between

groups were not measured for race because of the elevated

homogeneity of the sample on this variable.

Age, Income, and Age of Onset. For the variable age, the ANOVA demonstrated significant global between-group differences, F (5, 158) = 2.45, p = .036. However, when specific groups were compared as pairs using the Scheffe formula, no two groups were found to be significantly different. This finding is not unusual because the Sheffe is a more conservative post-hoc measure. Similarly, groups were globally determined to be different on the variables income, F (5, 158) = 2.55, p = .029, and age of onset, F (5, 158) = 2.77, p = .02, but no significant pairwise differences were uncovered using the Scheffe.

Interpersonal Distrust. On the Interpersonal Distrust Subscale of the EDI, even though the general ANOVA test revealed significant between-group differences, F (5, 157) = 2.436, p = .037, the Scheffe procedure indicated that no two specific groups were significantly different at the p = .05 level.

Significant Between-Group Differences

Percentage Overweight. The variable percentage overweight demonstrated significant between-group differences on the ANOVA, F (5, 157) = 20.05, p < .0001. On the Sheffe test, the second group was found to be significantly heavier than all other groups. The range of percentages for this group was 73% to 198% overweight with a mean of 132.1%. Other groups had means between 44.6% and 63.0%. See Table 4.1 for a summary of between-group

Table 4.1 Significant Differences Between Groups

Percentage Overweight

Mean	Group	5	6	4	3	1	2
44.6	5						
46.7	6						
47.9	4						
48.8	3						
63.0	1						
132.1	2	*	*	*	*	*	

Dieting Status

Mean	Group	2	5	3	1	4	6
2.3	2						
3.4	5						
3.5	3						
3.6	1						
5.9	4	*		*			
6.9	6	*	*	*	*	*	

* p < .05

Table 4.1 Significant Differences Between Groups (Continued)

Weight Locus of Control

Mean	Group	6	5	4	3	1	2
6.67	6						
7.00	5						
7.13	4						
7.58	3						
8.89	1						
13.00	2	*	*	*	*	*	

Ineffectiveness

Mean	Group	6	3	5	4	2	1
2.07	6						
2.46	3						
3.10	5						
3.25	4						
4.17	2						
6.74	1	*	*				

* p < .05

Table 4.1 Significant Differences Between Groups (Continued)

Interoceptive Awareness

Mean	Group	6	3	5	4	2	1
2.00	6						
2.76	3						
3.00	5						
3.67	4						
3.92	2						
8.16	1	*	*	*	*	*	

Introceptive Awareness Revised

Mean	Group	6	3	5	4	2	1
2.00	6						
2.70	3						
3.11	5						
3.77	4						
3.92	2						
8.22	1	*	*	*	*	*	*

* $p < .05$

differences on this variable.

Dieting Status. As might be expected based on the nature of the groups, they were found to be significantly different on dieting status, F (5,158) = 6.99, p < .0001. The Scheffe test revealed that the sixth group had dieted significantly longer than all other groups except the fourth group, p < .05. In turn, group four claimed to have dieted significantly longer than groups two and five. Table 4.1 presents a summary of these differences.

Weight Locus of Control. Groups were determined to be globally different on WLOC, F (5, 158) = 9.046, p < .0001. The second group was found to be significantly different from all other groups at the p = .05 level. None of the other groups significantly differed from each other. The mean score for group two on this variable was 13.00 (SD = 3.93) while the other group means ranged from a low of 6.67 (SD = 1.95) for the sixth group to 8.89 (SD = 3.18) for group one. Thus, group two had test results significantly more external than the other groups on this scale. These results are also presented in Table 4.1.

Ineffectiveness. The ANOVA demonstrated significant differences between groups on the Ineffectiveness Subscale, F (5, 157) = 5.62, p = .0001. On this variable, group one scored significantly higher, indicating a higher sense of ineffectiveness (M = 6.74, SD = 5.51), than two other groups, group six (M = 2.07, SD = 2.69) and group three (M = 2.46, SD = 3.84). No other pairs of groups were

significantly different at the alpha = .05 level. See
Table 4.1 for an overview of these differences.

Interoceptive Awareness. Interoceptive Awareness and
Interoceptive Awareness-Revised subscales were shown to
score similarly across groups. There were significant
between-group differences, F (5, 157) = 10.27, p < .0001;
F (5, 157) = 10.94, p < .0001, for the IA and IAR scales
respectively. For the first of these measures the group
one participants scored significantly higher (M = 8.16,
SD = 5.55) than group six (M = 2.00, SD = 2.42), group
three (M = 2.76, SD = 3.51), group five (M = 3.00,
SD = 3.43), and group four (M = 3.67, SD = 3.43). On
the Interoceptive Awareness-Revised Scale a similar pattern
emerged; the first group scored significantly higher
(M = 8.37, SD = 5.52) than group six (M = 2.20, SD = 2.48),
group three (M = 2.70, SD = 3.38), group five (M = 3.20,
SD = 2.76), and group four (M = 3.58, SD = 3.54).
Additionally, they were also significantly higher than
the second group (M = 3.67, SD = 4.81). Table 4.1 presents
a summary of these results.

Primary Hypotheses Testing

Results of the hypotheses testing for the five primary
hypotheses will be presented in this section. As stated
previously, mutiple regression was used to analyze the
data. The hierarchical model of multiple regression, as
opposed to simultaneous or stepwise models, was selected
for several reasons. This method allows the researcher to

enter independent variables into the regression equation one by one in a predetermined order. This is an appropriate model when one has an independent variable which carries the primary focus, and other independent variables of secondary importance which need to be controlled. In this research, age of onset was the variable of primary relevance, whereas the others were controlled for their confounding influence.

Partial correlations coefficients were selected over a semipartial correlation analysis. In this computation the effect of the second independent variable (X_2) is partialled out from the first independent variable (X_1) as well as from the dependent variable (Y') in the regression equation $Y' = B_1 X_1 + B_2 X_2$. This procedure is in contrast to a semipartial correlation, in which the effects of X_2 are partialled out from X_1 but not from Y' before calculating the correlation between X_1 and Y'. In the present research, it was desirable to remove the effects of the confounding variables from age of onset (X_1) as well as from each of the dependent variables. An example of why this method was selected might clarify matters. It is reasonable that LOC (a dependent variable) would be directly influenced by age. Very young and very old persons may feel less in control of their lives than middle-aged adults who often have financial resources, control of their bodily functions, and more autonomy. Similarly, age of onset might be influenced by age; a

forty-year-old could have a thirty-five-year age of onset, but a twenty-year-old could not. Therefore, the effects of age should be removed from both the dependent variable (LOC) and from the primary independent variable (age of onset) to determine the pure relationship between these two variables.

It should be noted that in the interpretation of the multiple regression equations, the focal point will not be upon comparing beta coefficients to each other. According to Neter and Wasserman, this practice is a frequent abuse of multiple regression. They state:

> The cautions in interpreting regression coefficients... apply to standardized regression coefficients as well: they show the effect of the given independent variable in the context of the other independent variables in the model. Changing the other independent variables will usually change the standardized regression coefficients when the independent variables are correlated among themselves. Furthermore, the standardized regression coefficients are affected by the spacing of the independent variables, which may be quite arbitrary. Hence, it is ordinarily not wise to interpret a standardized regression coefficient as reflecting the importance of the independent variable (1974, p. 268).

When the researcher is interested in the relationship between each of the independent variables and the dependent variable, then beta coefficients are sometimes a focal point of the analysis. However, for the purpose of the present study, the research question concerns the relationship between age of onset and each of the individual dependent variables. The independent variables

that are added to the equation after age of onset are
included for the purpose of controlling their confounding
effects. For example, the research question is not how
education (an independent variable of secondary importance)
affects locus of control, but whether it masks the
relationship between age of onset of obesity and locus of
control.

Thus, the overall proportion of variance in the
dependent varible, which is accounted for by the regression
equation (R^2), will be evaluated rather than individual
beta coefficients.

Preliminary Considerations and Analyses

Assumptions of Multiple Regression. Several
assumptions must be met before a multiple regression
analysis should proceed: normality, linearity, and
homoscedasticity of residuals. These assumptions were
tested through the examination of scatterplots of
residuals, plotted against the varying values of the
predicted dependent variable. If the overall shape of the
scatterplot is rectangular with a concentration of scores
along the center, the assumptions have been met; this
pattern was found for the plotted data, thus meeting the
necessary criteria.

Outliers. Outliers are data points with extreme
values on one or a combination of variables, so that they
unduly influence the size of correlation coefficients.
Rummel (1970) recommends using a cutoff score of three

standard deviations above or below the mean for identifying

outliers. None of the data points approached this level;

therefore, there was no need to delete or transform scores.

Missing Data. According to Tabachnick and Fidell

(1975), if only a few units of data are missing from a

large data set, the problems created are not serious and

almost any procedure for handling them will create similar

results. In the present research, one respondent failed to

complete the Eating Disorder Inventory; another deleted her

weight. This is a minimal amount of data loss. Missing

data was handled with insertion of the mean value on the

variable of interest. This is a conservative method of

handling the data, and one that has the advantage of not

distorting the central tendency of the variable itself.

Multicollinearity and Singularity. Multicollinearity

occurs when two variables are very highly correlated.

Singularity, on the other hand, occurs when a variable is a

linear combination of others. These conditions can be

problematic in that correlations may be inflated or

deflated. Neither of these problems were evidenced in the

present research. No two variables had a Pearson product

moment correlation stronger than r = .3171 (other than

dependent variables which are not entered into the same

regression equation.) Multicollinearity and singularity

can also be identified through high squared multiple

correlations (SMC's, in which each independent variable

serves as a dependent variable while the others are used as

independent variables) or through low tolerances (1 - SMC).

For the present research tolerances were very high, ranging

from .80989 to .99999. Therefore multicollinearity and

singularity were not evidenced.

Dichotomous Variables. Correlations between a

continuous and a dichotomous variable may be deflated if

most of the responses to the dichotomous variable fall into

one category. Rummel (1970) suggests deleting dichotomous

variables if they have 10% or fewer of the cases in one

category. In the present research, 16.5% of the sample was

male, allowing this dichotomous variable to remain in the

regression analysis. No other dichotomous variables were

used in the regression equations.

Entry of Variables into the Equation. Hierarchical

regression was selected so that variables could be entered

into the equation one by one in the order of their

importance to the study, or according to some other

criteria. Age of onset was entered first because it is the

variable of primary theoretical interest. Other variables

were entered to control for their potential confounding

effect. Their ordering is not as crucial to the study as

is the placement of age of onset first. Certainty of age

of onset was entered second to determine the effect of this

measure of reliability on $\underline{R}^2$. Age was placed third because

of its obvious relationship to age of onset; for example,

because a twenty-year-old could not have a forty-year age

of onset, the chronological age must be controlled. After

entering variables most directly related to age of onset, the variables related to weight were entered, first the stability of weight and then the percentage overweight. Dieting status came next because of its relationship to the weight variables, then sex, education, and income. The last two variables were entered in order because of the potential effect of education upon income. Whenever a plausible chronological order was implied by the variables, it was used to determine their entrance position. For example, a person's sex precedes his or her education (and may have some effect upon it) which often precedes and influences the earning of an income.

Multiple Regression Analyses

Ineffectiveness. Nine independent variables were entered into the regression equation to test the first research hypothesis, which is stated below.

Hypothesis One: Obese adults with earlier ages of onset of obesity will score higher on the Ineffectiveness Subscale of the EDI than obese adults with later ages of onset, when the effects of the eight potentially confounding variables are controlled.

Calculated without any correction for confounding variables, age of onset had an insignificant negative Pearson product-moment correlation with ineffectiveness (r = -.0273, p = .365). This accounted for only .074% of the variance in the Ineffectiveness Scale. Adding the other variables improved the correlation so that the

equation accounted for 8.11% of the variance,

F (9, 152) = 1.49, p > .05. This was not a significant

finding. Interestingly, however, adding the variable

"percentage overweight" to the equation accounted for a

large increase in the variance explained, adding 5.73% of

explained variance to the equation. Please see Table 4.2

for a summary of the hierarchical regression analysis and

Figure 4.1 for the final standardized regression equations.

Interpersonal Distrust. Regression for the

Interpersonal Distrust Scale was performed using the same

procedure as with the Ineffectiveness Scale. The

directional hypothesis is stated below.

Hypothesis Two: Obese adults with earlier ages of

onset of obesity will score higher on the Interpersonal

Distrust Subscale of the EDI than obese adults with later

ages of onset, when the effects of the eight potentially

confounding variables are controlled.

Calculated without any correction for potentially

confounding variables, Interpersonal Distrust had an

insignificant positive correlation with age of onset

(r = .0065, p = .467). Used as a predictor of

interpersonal distrust, the age of onset accounted for

significant relationship at the p = .05 level. When age

of onset was used in conjunction with the eight other

predictors, the regression equation accounted for 3.5% of

the variance. Because this is not a significant

proportion, the null form of this hypothesis could not be

Table 4.2 Hierarchical Regression for Ineffectiveness with Nine Predictor Variables

Step	Variable Entered	R	R Increase	F
1	Age of Onset	.00074	.00074	.11911
2	Certainty	.00141	.00067	.11221
3	Age	.00602	.00461	.31877
4	Weight Stability	.00948	.00346	.37561
5	Percent Overweight	.06677	.05729	2.23227
6	Dieting Status	.06748	.00071	1.86928
7	Sex	.07656	.00909	1.82401
8	Education	.07770	.00114	1.61121
9	Income	.08111	.00341	1.49081

a R Increase represents the additional proportion of variance accounted for by the regression equation as a result of adding the independent variable.

b F tests the overall significance of the regression equation at each step.

$$Y_1' = .043X_1 + .027X_2 + .054X_3 + .030X_4 + .229X_5 + .009X_6 + .093X_7 - .024X_8 - .065X_9$$

$$Y_2' = -.408X_1 + .523X_2 + .172X_3 - .314X_4 + .440X_5 + .530X_6 - .369X_7 + .257X_8 - .754X_9$$

$$Y_3' = -.094X_1 + .087X_2 + .097X_3 + .045X_4 + .100X_5 + .039X_6 + .036X_7 - .047X_8 - .015X_9$$

$$Y_4' = -.007X_1 + .059X_2 - .170X_3 + .069X_4 + .145X_5 - .001X_6 - .098X_7 + .022X_8 - .123X_9$$

$$Y_5' = -.020X_1 + .258X_2 + .057X_3 - .045X_4 + .281X_5 - .140X_6 + .067X_7 - .008X_8 + .013X_9$$

Y_1' = Predicted score on Ineffectiveness Scale

Y_2' = Predicted score on Interpersonal Distrust Scale

Y_3' = Predicted score on Interoceptive Awareness Scale

Y_4' = Predicted score on Locus of Control

Y_5' = Predicted score on Weight Locus of Control Scale

X_1 = Age of Onset

X_2 = Certainty of Age of Onset

X_3 = Age

X_4 = Weight Stability

X_5 = Percent Overweight

X_6 = Dieting Status

X_7 = Sex

X_8 = Education

X_9 = Income

Figure 4.1 Final Standardized Regression Equations

rejected, F (9,152) = .62, p > .05. Please see Table 4.3
for a summary of the hierarchical regression and Figure 4.1
for the final standardized regression equation.

Interoceptive Awareness. Hypothesis three was tested
using the same procedure as in the previous two hypotheses.
The research hypothesis is stated below.

Hypothesis Three: Obese adults with earlier ages of
onset of obesity will score higher on the Interoceptive
Awareness Subscale of the EDI than obese adults with later
ages of onset, when the effects of the eight potentially
confounding variables are controlled.

When age of onset was used alone as a predictor of
interoceptive awareness, it accounted for 1.1% of the
variance, an insignificant amount, F (1,160) = 1.74,
p > .05. Controlling for the eight other predictor
variables brought the R^2 up to .048; this indicates that
the equation accounted for 4.78% of the variance in the
dependent variable. R^2 was not significant and the null
hypothesis was retained, F (9,152) = .84, p > .05. Please
see Table 4.4 for a summary of the regression analysis
and Figure 4.1 for the final standardized regression
equation.

This hypothesis was also tested using the revised
version of the Interoceptive Awareness Scale (IAR), with
very similar results. Age of Onset alone accounted for
conjunction with the eight other variables. These
statistics were not significant, F (1,60) = 1.58, p > .05;

Table 4.3   Hierarchical Regression for Interpersonal Distrust with Nine Predictor Variables

Step	Variable Entered	R	R Increase	F
1	Age of Onset	.00004	.00004	.00603
2	Certainty	.01673	.01670	1.35305
3	Age	.02040	.00367	1.09677
4	Weight Stability	.02855	.00815	1.15343
5	Percent Overweight	.03023	.00168	.97256
6	Dieting Status	.03278	.00255	.87544
7	Sex	.03451	.00173	.78638
8	Education	.03453	.00002	.68399
9	Income	.03548	.00095	.62122

a R Increase represents the additional proportion of variance accounted for by the regression equation as a result of adding the independent variable.

b F tests the overall significance of the regression equation at each step.

Table 4.4   Hierarchical Regression for Interoceptive Awareness with Nine Predictor Variables

Step	Variable Entered	R	R Increase	F
1	Age of Onset	.01078	.01078	1.74326
2	Certainty	.01719	.00641	1.39059
3	Age	.02854	.01135	1.54716
4	Weight Stability	.03292	.00438	1.33608
5	Percent Overweight	.04170	.00878	1.35778
6	Dieting Status	.04397	.00226	1.18804
7	Sex	.04526	.00129	1.04294
8	Education	.04758	.00232	.95547
9	Income	.04777	.00018	.84719

a   R Increase represents the additional proportion of variance accounted for by the regression equation as a result of adding the independent variable.

b   F tests the overall significance of the regression equation at each step.

$\underline{F}$ (9,152) = .83, $\underline{p}$ > .05, for one and nine independent variables respectively. The null hypothesis was retained.

Locus of Control. The fourth hypothesis was also tested with hierarchical multiple regression. Its directional form is stated below.

Hypothesis Four: Obese adults with earlier ages of onset of obesity will score higher on Rotter's I-E Scale than obese adults with later ages of onset, when the effects of the eight potentially confounding variables are controlled.

Age of onset of obesity had a significant correlation with Locus of Control even when other predictor variables were not controlled ($\underline{r}$ = -.14, $\underline{p}$ = .036). Individuals with an earlier age of onset tended to be more external in their locus of control, as predicted. When age of onset was placed alone into the regression equation, it accounted for 1.88% of the variance ($\underline{R}^2$ = .018). Adding certainty of onset brought the $\underline{R}^2$ up to .026; age brought it up to .050; stability, to .052; and percentage overweight, to .077. Thus, these five variables accounted for 7.68% of the variance, $\underline{F}$ (5, 156) = 2.60, $\underline{p}$ < .05. Adding the remaining predictor variables to the equation (dieting status, sex, education, and income) increased $\underline{R}^2$ to .084, but they detracted from the significance of the F ratio, mostly because of the change in the degrees of freedom. Therefore, they were dropped from the regression equation. To summarize, when the effects of certainty of age of

onset, age, weight stability, and percentage overweight were controlled, age of onset accounted for a significant amount of the variance in locus of control. The null hypothesis was rejected. Please see Table 4.5 for a summary of the regression analysis and Figure 4.1 for the final standardized regression equation.

Weight Locus of Control. Hypothesis Five, as stated below, was tested with a hierarchical multiple regression analysis.

Hypothesis Five: Obese adults with earlier ages of onset of obesity will score higher on Saltzer's WLOC Scale than obese adults with later ages of onset, when the effects of the eight potentially confounding variables are controlled.

From the Correlational Matrix in Appendix I, it is apparent that age of onset alone does not have a significant Pearson product-moment correlation with weight locus of control (r = -.0738, p = .174). When entered into the regression equation alone, it accounted for .55% of the variance in WLOC. This is not a significant amount, F (1,160) = .88, p > .05. However, when certainty of age of onset was controlled, the percentage of variance explained increased to 7.74%. This is a significant amount of the variance, F (2, 159) = 6.67, p <.05. Adding the other predictor variables increased this amount to 19.37%, F (9,152) = 4.07, p < .05. Therefore, the null hypothesis was rejected. Obese adults with an earlier age

Table 4.5   Hierarchical Regression for Locus of Control with Nine Predictor Variables

Step	Variable Entered	R	R Increase	F
1	Age of Onset	.01875	.01875	3.05696
2	Certainty	.02594	.00719	2.11679
3	Age	.04996	.02402	2.76950*
4	Weight Stability	.05202	.00207	2.15403
5	Percent Overweight	.07679	.02476	2.59503*
6	Dieting Status	.07680	.00001	2.14890
7	Sex	.08414	.00734	2.02108
8	Education	.08414	.00000	1.75701
9	Income	.09638	.01224	1.80128

a   R Increase represents the additional proportion of variance accounted for by the regression equation as a result of adding the independent variable.

b   F tests the overall significance of the regression equation at each step.

*   Represents significance at the alpha = .05 level.

of onset were more external in their WLOC scores, as predicted. See Table 4.6 for a summary table of the regression analysis and Figure 4.1 for the final standardized regression equation.

Extra Analyses

Correction for Reliability of Age of Onset. Because age of onset is a variable that relies on the participant's memory, the regression analyses of the first five hypotheses were recalculated using only those subjects who said they were very certain or fairly certain of the reported age. Because poor reliabilities can decrease correlations between variables, this reanalysis was an attempt to correct for that possibility. This change reduced the sample size to 150, but produced similar results. A significant proportion of the variance in Locus of Control (R^2 = .095, F (7, 140) = 2.10, p > .05) and Weight Locus of Control (R^2 = .127, F (8, 139) = 2.52, p > .05) was accounted for by age of onset when the effect of the other independent variables was controlled. In the locus of control regression equation the variable "income" was deleted because its contribution to the explained variance did not counteract its effect upon the degrees of freedom and upon the F ratio. For Interpersonal Distrust (R^2 = .023, F (8, 139) = .41, p >.05), for Ineffectiveness (R^2 = .087, F (8, 139) = 1.66, p > .05), and for Interoceptive Awareness (R^2 = .043, F (8, 139) = .79, p > .05), none of the proportions of

Table 4.6 Hierarchical Regression for Weight Locus of Control with Nine Predictor Variables

Step	Variable Entered	R	R Increase	F
1	Age of Onset	.00548	.00548	.88178
2	Certainty	.07737	.07189	6.66694*
3	Age	.08063	.00326	4.61916*
4	Weight Stability	.08173	.00110	3.49348*
5	Percent Overweight	.17342	.09168	6.54571*
6	Dieting Status	.18970	.01628	6.04783*
7	Sex	.19383	.00413	5.28966*
8	Education	.19386	.00003	4.59924*
9	Income	.19400	.00014	4.06515*

a R Increase represents the additional proportion of variance accounted for by the regression equation as a result of adding the independent variable.

b F tests the overall significance of the regression equation at each step.

* Represents significance at the alpha = .05 level.

variance reached statistical significance. Therefore, the findings previously reported under each of the hypothesis tests were upheld.

Correction for Group Membership. Careful analysis of between-group differences revealed that the second group was somewhat different from the other groups. It had significantly more external Weight Locus of Control scores and significantly higher weights. The 95% confidence interval for the group mean age of onset (5.6020, 10.0647) did not overlap with that of any other group, nor with the 95% confidence interval of the total sample (15.8201, 19.3750), even though the Scheffe formula did not find this group significantly different on age of onset. Because multiple regression rests on the assumption that the participants are drawn from the same distribution, it was considered important to check the effect on data analysis if this group were omitted.

Deleting this group left a sample size of 152. Independent variables were entered into each regression equation in the hierarchical order described previously. Using only five of the groups changed the outcome of one of the hypothesis tests. The proportions of variance accounted for were as follows: Locus of Control (R^2 = .075, p > .05), Weight Locus of Control (R^2 = .12, p < .05), Ineffectiveness (R^2 = .10, p > .05), Interpersonal Distrust (R^2 = .044, p > .05), and Interoceptive Awareness (R^2 = .07, p > .05). Thus, when

tested without the second group, the proportion of explained variance was significant for only the Weight Locus of Contol regression equation. A significant proportion of the variance in Locus of Control had been explained by the regression equation in which group two had been included, but not when it was excluded. This finding will be discussed further in Chapter V.

<div align="center">Secondary Hypotheses Testing</div>

Rank Among Siblings and Age of Onset

Point-biserial correlation was the statistical measure chosen to test both of the secondary hypotheses. It is the appropriate measure when one needs to determine the relationship between a dichotomous variable (1 = youngest or only child, 2 = other sibling position) and a continuous variable with interval properties (age at onset).

The hypothesis tested is listed below:

Hypothesis Six: Obese adults with an earlier age of onset will more likely have been only or youngest children than obese adults with a later age of onset.

This hypothesis was not supported. The point-biserial correlation yielded a value of r = -.00287. The mean onset age for the "youngest or only" group was 17.54 (SD = 10.97) as compared to a mean of 17.62 (SD = 11.74) for the "other position" group. An ANOVA computed on the two groups yielded F (1, 162) = .001, p = .97.

However, this analysis was recalculated on several

subgroups of the sample. An attempt was made to increase the reliability of the "age of onset" statistic. Using only those participants who stated they were fairly certain or very certain of the age of onset (n = 150), the correlation changed to r = .037. Sampling only those participants who said they were very certain of the onset age (n = 79), the correlation became even stronger (r = .12). Because this is not a significant correlation (p > .05), the null hypothesis still could not be rejected.

Stress at Onset and Age of Onset

The last of the hypotheses was also tested with a point-biserial correlation. As in the previous test, a dichotomous variable (1 = stressor present at time of initial weight gain, 2 = no stressor present) was correlated with a continuous variable (age of onset). This hypothesis is stated below.

Hypothesis Seven: Obese adults with an earlier age of onset will be less likely to report the occurrence of a stressor prior to or at the time of initial weight gain than will obese adults with a later age of onset.

The point-biserial correlation yielded a value of r = .22. A comparison of the mean age of onset of the group reporting a stressor (M = 20.53, SD = 9.72) with the mean age of onset of the group not reporting a stressor (M = 15.41, SD =12.31) demonstrated that the group reporting a stressor has a significantly older onset age than the group without a stressor, as predicted. An ANOVA

of the between-group difference yielded $\underline{F}$ (1, 162) = 8.247 with a signifance level of $\underline{p}$ = .0046. Thus, the null hypothesis was rejected.

This statistic was also recalculated using the subgroup of the sample who stated they were fairly certain or very certain of the age of onset ($\underline{n}$ = 150). Making this change slightly increased the point-biserial correlation to .25. Increasing the reliability of the age of onset statistic one step further, and including only those participants who said they were very certain of the onset age ($\underline{n}$ = 79), increased this correlation coefficient even further ($\underline{r}$ = .42).

Stressors which were reported by the sample varied considerably. See Appendix J for a list of reported stressors.

The reader is referred to Table 4.7 for an overview of the results of the seven main hypotheses tests.

Summary

The findings from the analysis of the data were presented in Chapter IV. Reliability of the instruments was computed using Cronbach's alpha. Correlations for the Eating Disorder Inventory subscales were acceptable. For Interoceptive Awareness, the coefficient equaled .71; for Interpersonal Distrust, .83; and for Ineffectiveness, .77. The Weight Locus of Control Scale had a lower coefficient of .47. The convergent validity of the WLOC Scale was measured by its correlation with Rotter's I-E Scale; it

Table 4.7 Overall Results of Hypotheses Testing

Hypothesis	Significance
1. Obese adults with earlier ages of onset of obesity will demonstrate higher levels of ineffectiveness than obese adults with later ages of onset, when the effects of eight potentially confounding variables are controlled.	Insignificant, $p > .05$
2. Obese adults with earlier ages of onset of obesity will demonstrate higher levels of interpersonal distrust than obese adults with later ages of onset, when the effects of eight potentially confounding variables are controlled.	Insignificant, $p > .05$
3. Obese adults with earlier ages of onset of obesity will demonstrate less interoceptive awareness than obese adults with later ages of onset, when the effects of eight potentially confounding variables are controlled.	Insignificant, $p > .05$
4. Obese adults with earlier ages of onset of obesity will demonstrate more external locus of control than obese adults with later ages of onset, when the effects of eight potentially confounding variables are controlled.	Significant, $p < .05$

Table 4.7 Overall Results of Hypotheses Testing (Continued)

Hypothesis	Significance
5. Obese adults with earlier ages of onset of obesity will demonstrate more external weight locus of control than obese adults with later ages of onset, when the effects of eight potentially confounding variables are controlled.	Significant, $p < .05$
6. Obese adults with earlier ages of onset will more likely be only or youngest children than obese adults with later ages of onset.	Insignificant, $p > .05$
7. Obese adults with earlier ages of onset will be less likely to report the occurrence of a stressor prior to or at the time of initial weight gain than will obese adults with later ages of onset.	Significant, $p < .05$

appropriately demonstrated a modest but significant
correlation.

Anova and Chi Square analyses were computed to
determine global between-group differences, followed by a
Scheffe post hoc analysis to test pairwise differences.
Pairs of groups were found to be significantly different on
the following variables: percentage overweight, dieting
status, WLOC, Ineffectiveness, and Interoceptive Awareness.
Overall, the second group appeared to be most different
from the other five groups.

The first five hypotheses were tested using
hierarchical multiple regression. Only two of the null
hypotheses were rejected: age of onset was found to
predict a significant amount of the variance in Locus of
Control and in Weight Locus of Control, when the effect of
the other independent variables was partialled out. Age of
onset was not found to account for significant proportions
of the variances of the other dependent variables,
Ineffectiveness, Interpersonal Distrust, Interoceptive
Awareness, and Interoceptive Awareness-Revised, even when
the effect of the other independent variables was removed.
Supplementary analyses were also performed on the data by
running subgroups of the sample: first the subsample who
said they were fairly certain or very certain of their age
of onset. Hypothesis testing did not appreciably change as
a result of this reanalysis. A second analysis was
computed on all participants except for those in group two.

One hypothesis test changed as a result of this recalculation; age of onset no longer accounted for a significant proportion of the variance in Locus of Control.

The last two hypotheses were calculated with a point-biserial correlation. Null hypothesis six was retained; no significant correlation could be demonstrated between age of onset of obesity and rank among siblings. Null hypothesis seven was rejected; a significant correlation was found between stress at onset and age at onset, with older onset individuals more likely to report a stressor. An attempt was made to improve the reliability of the age of onset variable, by reanalyzing the data with the subgroup who were fairly certain or very certain of this age, and then with the subgroup who were very certain. Each improvement in the reliability resulted in a corresponding increase in the correlation. The correlation between rank among siblings and age of onset still did not reach significance, however. Please see Table 4.7 for a summary of the results of the hypotheses tests.

In Chapter V some conclusions and a discussion of these results will be presented.

CHAPTER V

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

In this chapter a summary of the results of the study
is presented, followed by some conclusions and a
discussion. Limitations of the research, implications for
treatment, and recommendations for future research conclude
the chapter.

Summary

Estimates of the incidence of obesity within the
general U.S. population have hovered around 30%. As a
review of the literature demonstrated, this large group
appears to be a heterogeneous one, for whom a single
explanatory theory and a single treatment approach have not
been established. Recent research has focused on finding
meaningful subgroups of the obese population, in order to
clarify causes, differences, and treatment implications for
this diverse group.

The purpose of the present study was to determine
whether personality differences occur among the obese
population as a function of age of onset, when the effect
of confounding variables is controlled. Are age of onset
differences consistent with the theoretical writings of
Hilde Bruch? Her writings suggest that persons with an
earlier age of onset have greater feelings of
ineffectiveness, increased interpersonal distrust, more
failure of interoceptive awareness, and higher external
locus of control.

In the present study age of onset was used as a continuous predictor variable. Previous studies broke down age of onset into subgroups, thus forfeiting valuable information and making generalizations difficult because of the different cutoff ages used to classify subgroups. In a hierarchical regression analysis, age of onset was the primary independent variable, used in five separate regression equations to determine its predictive capacity for five dependent variables: ineffectiveness, interpersonal distrust, interoceptive awareness, locus of control, and weight locus of control. The first three dependent variables were measured by subscales of the Eating Disorder Inventory. Locus of control was measured generally by Rotter's I-E Scale. The construct was also measured specifically with regards to weight, using Saltzer's Weight Locus of Control Scale. Eight additional independent variables were entered into each regression equation to control for their potential confounding effects: certainty of age of onset, age, weight stability, percentage overweight, dieting status, sex, education, and income.

Two secondary hypotheses were tested using a point-biserial analysis. The purpose of these tests was to determine (a) whether the presence of a stressor correlated positively with age of onset and (b) whether the sibling rank of only or youngest child correlated negatively with age of onset.

Sample

Volunteers from six sources agreed to participate in the study. These 164 participants were 20% or more overweight; they were predominantly white (98.2%) and female (83.5%). Their mean age was 43.7 years with a mean age of onset of 17.6 years and a mean percentage overweight of 57.4%. More complete demographic data can be found in Chapter III. Only one of the six groups appeared to be appreciably different from the others. Hypothesis tests using multiple regression were analyzed both with and without this group, because an underlying assumption of this analysis is that all members of the sample are drawn from the same distribution.

Results

Reliabilities of the instruments were computed using Cronbach's alpha. Correlations for the subscales of the Eating Disorder Inventory and Rotter's I-E Scale were acceptable, whereas the WLOC Scale had a lower coefficient of .47. In assessing discriminant validity, an instrument should not correlate too highly with previous measures from which it is supposed to differ. Accordingly, the WLOC Scale had a modest but significant correlation with Rotter's I-E Scale (r = .30, p <.001).

For the primary hypothesis tests, three of the null hypotheses were not rejected. Age of onset accounted for 7.77% of the variance in Ineffectiveness when the effects of the eight other independent variables were controlled.

This was not a significant proportion ($p > .05$). Similarly, it accounted for 3.55% of the variance in Interpersonal Distrust and 4.77% of the variance in Interoceptive Awareness, when the effect of the other variables was controlled. Neither of these proportions is significant at the $p = .05$ level.

Two of the primary null hypotheses were rejected, however. When the effects of five of the confounding independent variables were controlled, age of onset accounted for 7.68% of the variance in Locus of Control, a significant proportion ($p < .05$). Similarly, when the effects of all eight of the confounding independent variables were controlled, age of onset accounted for 19.4% of the variance in Weight Locus of Control. This proportion was also significant, allowing rejection of the null hypothesis ($p < .05$). Thus, earlier age of onset individuals were generally more external in their locus of control and weight locus of control scores, as predicted.

For the two secondary null hypotheses, one was rejectedand one was retained. No significant relationship was demonstrated between rank among siblings and age of onset ($r = -.003$, $p > .05$); thus the sixth null hypothesis was retained. The seventh null hypothesis was rejected. A significant relationship ($r = .22$, $p = .0046$) was found between the presence of a stressor at onset and age of onset of obesity, with the participants who claimed an older onset age more likely to report a stressor. This

analysis was recalculated on subgroups of the sample who claimed more certainty on their estimated age of onset. As the sample increased in certainty, the correlation grew stronger. For those who were very certain of their onset age, the correlation coefficient increased to r = .42.

Discussion

The following section will focus first on the primary null hypotheses which were rejected, and then on those which were retained. A discussion of the secondary hypotheses will precede some general observations and findings regarding this sample.

Primary Hypotheses

The results of this study partially supported Bruch's theory. Both Weight Locus of Control (WLOC) and Locus of Control (LOC) became significantly more internal as the age of onset increased. However, the correlations between age of onset and each of these variables does not imply causality. While it is possible that externality causes failure to control weight, it is equally plausible that long term obesity might lead to externality. It is also possible, as Bruch described, that other factors contribute to the development of both of these characteristics, for example, parental overfeeding when the child required some other form of comfort.

It is interesting that age of onset was a much better predictor of WLOC than of LOC. The lower reliability of WLOC (r = .47) suggests that the true correlation between

these variables would be even higher than that reported. Even so, age of onset accounted for 19.37% of the variance in WLOC, when the effect of the other variables was controlled. This percentage is in contrast to a lower, but still significant, proportion of variance in LOC (7.68% with five predictor variables). This finding suggests that age of onset is more highly related to a weight-specific locus of control, rather than Bruch's generalized personality variable. Had a more reliable measure of WLOC been available, this finding would most likely be magnified (Rummel, 1970).

Deletion of group two from the sample, followed by a reanalysis of the data, changed the results of one of the hypothesis tests. Age of onset no longer accounted for a significant proportion of the variance of Locus of Control ($\underline{R}^2$ = .075, $\underline{p}$ > .05) when the effects of the potentially confounding variables was controlled. This 7.5% of the variance explained in LOC without the second group is not much smaller than the 7.68% explained when this group was included. A likely reason for the difference is that the second group expanded the range of the sample on this variable. More homogeneous samples tend to deflate correlations; this is a primary reason for maximizing the range of scores for a sample, and the primary rationale for sampling widely from a population.

Age of onset was not able to account for a significant proportion of the variance in any of the EDI measures. It

is noteworthy that all of the EDI measures correlate more strongly with the global LOC Scale than with the specific WLOC Scale. (See Appendix I.) This pattern is consistent with the Garner and Olmsted's global definitions of the constructs (1984). Even though the instrument was developed for use with eating disorders, it measures global personality variables. For example, ineffectiveness measures feelings of inadequacy, insecurity, worthlessness and lack of control over ones life. This construct is even more general than locus of control in that it contains a component of negative self-evaluation. Perhaps age of onset would more successfully predict weight-specific measures of each of these variables. For example, instead of measuring global ineffectiveness, one could measure specific feelings of ineffectiveness and devaluation regarding ones weight. Instead of measuring global interpersonal distrust, one might use such items as: "Do you believe others will treat you unfairly because of your weight?" or "Do you feel uncomfortable about what others think and say about your body size?" Similarly, interoceptive awareness that is weight-specific might focus on lack of awareness of hunger or satiety, rather than more global affects. Thus, it is possible that following the lead of the locus of control literature (by utilizing domain-specific personality constructs) might lead to different hypothesis test results.

An interesting question arises in comparing the

results of two of the hypothesis tests. If early age of
onset individuals demonstrate elevated externality in LOC,
but not elevated ineffectiveness, the difference might lie
in the different definitions of these two variables; that
is, ineffectiveness includes self-condemnation. Thus, the
early onset individuals demonstrated increased externality
but not the increased self-condemnation that would have
been part of ineffectiveness. Caution in interpreting
these results is necessary because of many overlapping
constructs and because of potential measurement errors.
Locus of control ("Can I do something?") and effectiveness
("Can I do something?" plus "Am I condemnable?") also
interact with responsibility ("Is it my fault if I can't do
something?") and valuing of the accomplishment at hand.
Nevertheless, these findings provide rich material for
further hypothesis testing. Perhaps an external locus of
control becomes more ego syntonic for early onset
individuals, so that they do not condemn themselves for
their lack of power. On the other hand, Garner and
Olmsted's (1984) sample of anorexic females demonstrated
elevated ineffectiveness. It is possible that the
self-condemnation inherent in this ineffectiveness provides
them with the motivation to take off weight. Of course,
this discussion is highly speculative and provides more
hypotheses than conclusions.

Another more likely interpretation of the
insignificant findings is possible. The EDI was normed

predominantly on a sample of female high school and college students. It was devised to assess psychological characteristics relevant to anorexia nervosa and bulimia, with special focus on differentiating subgroups and traits of the disorders. During the construction of the instrument, items which differentiated between anorexic subjects and female controls were retained; those that did not discriminate were replaced. Items which might have differentiated between obese subjects and normal-weight controls on the relevant personality variables were not assessed or valued based on this characteristic, nor was there an attempt to include items that would differentiate subgroups or traits within the obese population. This problem points out the need for the development of similar scales appropriate to the obese population. It also suggests that the conclusion that there are no differences between onset groups on these variables (ineffectiveness, interoceptive awareness, and interpersonal distrust) is not warranted. Using the EDI with an obese sample may well be inappropriate because it was normed and developed for such a different population.

Secondary Hypotheses

The study did not support Bruch's hypothesis that an early age of onset is more likely to result for a child who occupies an only child or youngest position in the family. Perhaps the difficulty lies in the measurement of sibling rank. Special problems arise, such as how to deal with

sibling death or miscarriage, half-siblings and stepsiblings, divided families, orphaned children, or long gaps between childbearing. So many variations occur within families, especially with current divorce and remarriage rates, that ascertaining a child's psychological position in the family is difficult. Bruch's early theorizing and writing took place in the 1940's and 1950's, long before escalation in the divorce rate, which might have made her task easier than it is today.

Bruch's theory that a person with an older age of onset is more likely to report stress at onset was supported. Not only was the correlation between these variables significant, but as the reliability of the age of onset measurement increased, the correlation grew stronger. According to Bruch's theory, the onset of obesity in adulthood is more likely to be an adjustment reaction to stress, whereas in childhood it is a reflection of personality disturbance. While the finding of this study is supportive of her theory, there are other explanations possible. Stress that is experienced by a child would not be conceptualized or verbalized in the same manner as by an adult. Thus, it seems more likely that it might fade from awareness. Preverbal experiences, or traumatic events that required repression, are also likely to be lost to recall, because children do not have adult coping mechanisms and may be more likely to rely on this primitive defense mechanism. These possiblities, plus the longer time period

between this research and a childhood age of onset, versus the shorter time period between this research and an adult age of onset, could well account for underreporting of stressors in the childhood-onset group.

Problems such as those cited above are inherent in retrospective studies. Studies of children at the time of onset might be helpful, but the researcher may then be reliant on reports of adult caretakers who may be motivated to conceal their own contributions to the child's trauma.

General Findings

Overall, this obese sample scored similarly (a) to other obese samples reported in the literature, as well as (b) to normal-weight norm groups on all measures. The EDI scores of this sample were well within the range described by Garner, Olmsted, and Ploivy (1983) for their obese sample. As in the present study, their obese group ($\underline{N}$ = 44) also scored similarly to the normal weight subjects on Ineffectiveness ($\underline{M}$ = 2.0, $\underline{SD}$ = 1.5), on Interpersonal Distrust ($\underline{M}$ = 2.2, $\underline{SD}$ = .12), and on Interoceptive Awareness, although the latter subscale has been revised since their study. A study of obesity by Garner and Olmsted (1984) similarly demonstrates a close match between an obese sample ($\underline{N}$ = 18) and their normal weight counterparts on all three subscales; scores from the present study are again similar to both.

For LOC, Gormanous and Lowe (1975) reported no significant differences between obese ($\underline{M}$ = 9.7, $\underline{SD}$ = 4.83)

and normal-weight subjects (M = 9.84, SD = 4.06). These scores are only slightly higher than those found in the present study (M = 8.13, SD = 3.90), but they are higher than those reported generally by Rotter (1966) also (M = 8.3, SD = 3.54).

On WLOC this sample's mean score of 8.07 (SD = 3.34) was similar to Saltzer's (1982) means for obese and mixed (obese and non obese) samples, which ranged from M = 7.04 (SD = 2.79) to 8.19 (SD = 3.05). The sample with the greatest internality (M = 7.04) were those who were starting a weight control program; this selection procedure may account for why they were slightly more likely to believe in personal ability to control weight; that is, persons who did not hold this belief might be less likely to join such a group.

That obese samples score similarly to each other and to normal-weight samples on these measures was not unexpected. These results are consistent with Stunkard and Mendelson's (1967) assertion that the obese population is no more nor less disturbed than the general population, and with the American Psychiatric Association's (1980) report that obesity per se does not constitute a psychiatric disorder.

Some secondary findings regarding the percentage overweight will be touched upon here. As might be

expected, an increased percentage overweight correlated
positively and significantly ($\underline{p}$ < .05) with feeling less
effective, with more externality in LOC and WLOC, with
earlier onset age, and with decreased income. (See
Appendix I.) Income differences might reflect previously
reported prejudice against heavier subjects (Allon, 1975).
Personality differences that might relate to income and
achievement were not uncovered by the present study.
Interestingly, however, the correlation between percentage
overweight and education was insignificant, in contrast to
previous studies (Mayer, 1975) that suggest that obese
individuals are discriminated against by school admissions
officers. Perhaps discriminatory practices are declining;
perhaps personal interviews are not included in screening;
or perhaps obesity itself, rather than the degree of
obesity, relates to prejudicial practices.

<div align="center">Limitations</div>

Problems and limitations of this study are presented
in the following section. Difficulties in sampling,
external validity, design, methodology, and instrumentation
are discussed.

<u>Sampling and External Validity</u>

Threats to external validity in this study are largely
a reflection of sampling difficulties. Participants were
mostly volunteer members of volunteer groups. The groups

that were selected were non-random in that their leaders
were willing and able to allow participation. These
leaders were more likely to be sympathetic to scientific
inquiry; perhaps they had done research themselves or had
family members who were researchers. Many of the major
weight control groups have policies which tend to
discourage outside research. Thus, generalization of
results to other weight control groups may not be
warranted. Also important to note is that group-joiners
may not be similar to non-group-joiners.

Also problematic to the external validity was the
usage of six different groups. There was overlap among
groups, that is, members who belonged to multiple groups or
cited past memberships; therefore the groups were not as
pure as they might seem at first. Between-group
differences were analyzed and statistically controlled to
maintain internal validity, but the conceptual process of
generalizing from six groups to a population does pose a
problem.

Even though this sampling procedure (of drawing from
six sources) did present difficulties, it also served to
increase the sample size and broaden the range of subjects
studied. These assets were essential to effectively
utilize a multiple regression analysis. A narrow range of
variance within a sample lowers correlation coefficients,

and underrepresents the true relationship between variables.

Many other studies narrowed their samples by studying a specific age group (Alessi and Anthony, 1969; Geiger, 1978; Kay, 1981; Mathews and Westie, 1966; and Mendelson and White, 1982) or weight classification (Castelnuovo-Tedesco and Schiebel, 1975). Studies that investigate age of onset differences within a sample drawn from one source are truncated on some of the demographic variables. For example, Schumaker and Wagner's study had a narrower age range (18 to 48 years, M = 23.2) smaller educational range (all had at least two years of college), and a smaller sample size (N = 60). Although other demographic variables are not reported, it is suspected that these too may be narrower. For example, the mean degree of obesity was 26.05% overweight; this suggests that superobese individuals were not included. Studies which approximate the size and variability on demographics of the current research also used multiple sources (Creekmore, 1984; McDonald, 1979).

Another potential problem in this study involves the interaction of selection and outcome. Within these non-random groups, a non-random sample of volunteers were given the instruments. These subgroups of the memberships may have been selectively different from the subgroups that

did not participate. One difference was that the more

successful dieters in the group (who were less than 20%

overweight at the time of the study) were automatically

eliminated. It is possible that excluding this subgroup

eliminated those members with a higher sense of

effectiveness and internal locus of control. Reasons that

some non-participants informally cited for not partaking in

the study were forgetfulness regarding the date of the

study, child care arrangements and costs, employment,

social engagements, and mistrust of research. Thus,

non-participants may have been busier, more socially

committed, less trusting of research or the researcher, or

more responsible for parental and employment obligations.

Participants may have been more altruistic, more committed

to the research question, more trusting, more compliant,

less pressed for time, or more organized in remembering the

date. Actual differences between these groups is unknown,

but it is clear that such differences may have interacted

with some of the outcome measures (distrust,

ineffectiveness, locus of control, and weight locus of

control) and that they make generalizations to a population

that includes nonvolunteers problematic.

Group members may also have been influenced by the

philosophy of the group. Some groups are competitive,

using external reinforcers, shame induction, and

encouragement as motivators. Other groups support
self-acceptance, and still others advocate turning over
weight control problems to a higher power. Thus, the
influence of group philosophies could well have influenced
test results of its members, especially locus of control,
effectiveness, and trust variables.

In conclusion, the nonrandom selection of subjects by
groups makes it difficult to generalize to other groups.
Selection within groups also presents a problem in
generalization to the whole group.

Design and Methodology

This descriptive research utilized one observation on
each participant. Participants were tested so that groups
of the sample received the same assessment under the same
conditions. Although careful attention was given to
consistency in instructions and procedures across groups,
slight variations may have influenced results. Instruments
were administered to groups mostly after one of their
regularly scheduled meetings; this of course was not the
case for the third group who arranged meeting times as
needed. Differences in time of day, hunger level, and
weigh-in procedures prior to testing may have also affected
individuals and/or whole groups.

Instrumentation

There were several problems with instrumentation.

First, all of the measures involved self-report.
Participants may have been intentionally dishonest, or
their responses may have been influenced by lack of
self-awareness or by self-deception. Although directions
were written and instructions given so as to reduce the
tendency of respondents to answer questions in a socially
desirable manner, this possiblity was minimized but
probably not eliminated.

A second problem in the research was that some of the
predictor variables were assessed retrospectively. General
memory failures, as well as selective ones, were discussed
previously in this chapter. The variables age of onset and
stress at onset were especially influenced by this
condition. Alternative methods, such as studying children
directly, are replete with their own difficulties.

One variable, stress at onset, presented a third, but
special, assessment problem. It was measured as major
trauma, rather than as minor daily hassles. This
definition gives consideration to the intensity of a
stressor, but does not as adequately tap the dimensions of
frequency or duration. Bruch's definition of stress lies
in the direction of major trauma, but increased clarity on
this distinction might have provided interesting additional
information.

A fourth problem in instrumentation was the use of the

Eating Disorder Inventory. Lack of significant findings on the hypotheses involving this instrument may have reflected its measurement of global personality variables rather than weight-specific ones. Another problem with the Eating Disorder Inventory is that it was developed so as to distinguish persons with bulimia or anorexia nervosa from individuals without eating disorders. Results are probably not valid for the wider range of nonpsychiatric subjects used in this study. These difficulties are discussed more thoroughly in this chapter with the primary hypotheses.

A fifth problem was presented by the Weight Locus of Control Scale. Its low reliability on this sample may have caused an underrepresentation of the true correlation between age of onset and WLOC.

Implications for Treatment

The results of this study have several implications for clinical treatment. As demonstrated by previous research (Leon and Roth, 1979), the sample was not a homogeneous one. This replicated finding suggests that concerned clinicians look beyond obesity per se as a diagnostic category. Age of onset appears to be an important dimension to include in this diagnosis. As previous research also demonstrated (Fitzpatrick, 1976; Stunkard and Mendelson, 1967) the earlier age of onset

correlated positively with external locus of control and greater degree of overweight, both of which make the problem more difficult to treat (Silverstone and Cooper, 1971; Stunkard and Mendelson, 1967). When these two conditions are present, treatment efforts may need to be more intense and of longer duration.

The elevated externality in locus of control and weight locus of control among the early-onset participants suggests that this variable also needs to be diagnosed prior to treatment, in addition to ascertainment of whether the weight gain constitutes an adjustment reaction to stress. The higher internal locus of control and the greater likelihood of an identifiable stressor found among the late-onset participants suggests that such patients might be most appropiately treated as having adjustment reactions. Short term interventions, medications, and stress management or other behavioral techniques might be used to help the adult-onset patient cope and return to normal weight. Interestingly, however, the later onset age seems to correspond with higher internal locus of control. Seeman and Evans (1962) (cited in Rotter, 1966) found internally-oriented patients more questioning of their treaters; they had a greater need to know about their disorders. These qualities may make them better candidates for insight therapy. Paradoxically, these patients (who

have the capacity and drive for insight) may be less likely to need such in-depth treatment for an adjustment reaction. The early age of onset patients may need more insight but be less receptive to it, because of their externality.

The discovery that a patient has an external locus of control can be handled in several ways. Short-term methods may encourage the person to find external support and techniques to help manage the weight. For the patient with the resources of time, money, and capacity for insight, the clinician may want to help restructure the personality and encourage incorporation of a greater sense of internality. For obese children who seem to be developing an external locus of control, parental training might effectively focus on helping parents to intervene in ways that could redirect their child's tendency, at an age when such personality variables are more amenable to change.

Implications for Future Research

The findings of this study have a number of implications for future research.

The finding that personality measures do correlate with age of onset in this study raises questions about other studies that fail to uncover such relationships. An advantage of the present design is that age of onset is retained as a continuous variable, rather than transformed into a quantitative one as in ANOVA designs. This

procedure brings into question all age of onset studies which fail to uncover significant relationships between age of onset and other variables, when age of onset is arbitrarily cut into distinct onset categories such as "adult", "juvenile", and "child". For example, Schumaker and Wagner (1977) reported that there were no significant differences between early and late age of onset groups in their degree of eating response to external cues. In contrast to the present study, they also found no significant correlation between age of onset and percentage overweight. If ANOVA studies could be reanalyzed or replicated with retention of age of onset as a continuous variable, perhaps such studies would report other findings. Schumaker and Wagner's insignificant but negative correlation (as predicted) between age of onset and external cue responsivity might have become significant with this more precise measurement procedure.

Using the Eating Disorder Inventory for this study presented some problems. Perhaps an instrument which measures weight-specific constructs would uncover differences that this instrument did not. Also helpful would be the development of an instrument that is valid for the obese population, and begins to differentiate subgroups of obese individuals.

The Weight Locus of Control Scale was an especially

appropriate tool for this research. Its reliability could be improved by adding more items, as well as revising the present ones to make this a more useful instrument.

An interesting finding of this study was that locus of control and weight locus of control correlated with age of onset. Yet the correlation was far from perfect. A multiple regression design with age of onset and locus of control as independent variables, used to predict treatment outcome, might better establish the relationship between these variables.

One of the major problems in age of onset research is the typical retrospective nature of the assessment. To circumvent this problem, a study of children as they become obese might be conducted out of a pediatrician's office. Presence of stressors at the time of onset, personality variables, and assessment of family dynamics could be evaluated close to the time of onset. Time and expenses permitting, these children could be followed to determine if there are differences between those who maintain the obese state versus those who return to normal weight. Differences that occur among children with varying ages of onset could also be studied. Studying participants close to the time of onset would also reduce contamination. After a person becomes obese, variables such as dieting attempts, diet group membership, discrimination,

interpersonal rejection, and other experiences that characterize the obese state, begin to influence the person. Once they have done so, the original causes of the obese state become confusingly intertwined with the results of being obese.

In conclusion, the development of better assessment tools appropriate for the obese population, the refinement of the WLOC to improve reliability, the assessment of interaction effects between general and weight-specific locus of control and age of onset, and age of onset research that is not retrospective seem to be appropriate avenues to further this line of research.

APPENDICES

PLEASE NOTE:

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These consist of pages:

APPENDIX "A"   pgs. 166-170

APPENDIX A

EATING DISORDER INVENTORY

EATING DISORDER INVENTORY

INSTRUCTIONS:

This is a scale which measures a variety of attitudes, feelings and behaviors. Some of the items relate to food and eating. Others ask you about your feelings about yourself. THERE ARE NO RIGHT OR WRONG ANSWERS SO TRY VERY HARD TO BE COMPLETELY HONEST IN YOUR ANSWERS. RESULTS ARE COMPLETELY CONFIDENTIAL. Read each question and circle the letter which applies best to you. Please answer each question very carefully. Thank you.

KEY: a=always, u=usually, o=often, s=sometimes, r=rarely, and n=never.

1. I eat sweets and carbohydrates without
    feeling nervous.   a   u   o   s   r   n

2. I think that my stomach is too big.   a   u   o   s   r   n

3. I wish that I could return to the
    security of childhood.   a   u   o   s   r   n

4. I eat when I am upset.   a   u   o   s   r   n

5. I stuff myself with food.   a   u   o   s   r   n

6. I wish that I could be younger.   a   u   o   s   r   n

7. I think about dieting.   a   u   o   s   r   n

8. I get frightened when my feelings
    are too strong.   a   u   o   s   r   n

9. I think that my thighs are too large.   a   u   o   s   r   n

10. I feel ineffective as a person.   a   u   o   s   r   n

11. I feel extremely guilty after
    overeating.   a   u   o   s   r   n

12. I think that my stomach is just the
    right size.   a   u   o   s   r   n

13. Only outstanding performance is good
    enough in my family.   a   u   o   s   r   n

14. The happiest time in life is when
    you are a child.   a   u   o   s   r   n

15. I am open about my feelings.   a   u   o   s   r   n

16. I am terrified of gaining weight.   a   u   o   s   r   n

17. I trust others.   a   u   o   s   r   n

18. I feel alone in the world.   a   u   o   s   r   n

19. I feel satisfied with the shape of
    my body.   a   u   o   s   r   n

20. I feel generally in control of
    things in my life.   a   u   o   s   r   n

21. I get confused about what emotion
    I am feeling.   a   u   o   s   r   n

22. I would rather be an adult than a child.   a   u   o   s   r   n

23. I can communicate with others easily.   a   u   o   s   r   n

24. I wish I were someone else.   a   u   o   s   r   n

25. I exaggerate or magnify the
    importance of weight.   a   u   o   s   r   n

26. I can clearly identify what emotion
    I am feeling.   a   u   o   s   r   n

27. I feel inadequate.   a   u   o   s   r   n

28. I have gone on eating binges where
    I have felt that I could not stop.   a   u   o   s   r   n

29. As a child, I tried very hard to
    avoid disappointing my parents
    and teachers.   a   u   o   s   r   n

30. I have close relationships.   a   u   o   s   r   n

31. I like the shape of my buttocks.   a   u   o   s   r   n

32. I am preoccupied with the desire
    to be thinner.   a   u   o   s   r   n

33. I don't know what's going on inside me. a u o s r n

34. I have trouble expressing my
    emotions to others. a u o s r n

35. The demands of adulthood are too great. a u o s r n

36. I hate being less than best at things. a u o s r n

37. I feel secure about myself. a u o s r n

38. I think about bingeing (over-eating). a u o s r n

39. I feel happy that I am not a
    child anymore. a u o s r n

40. I get confused as to whether or not
    I am hungry. a u o s r n

41. I have a low opinion of myself. a u o s r n

42. I feel that I can achieve my standards. a u o s r n

43. My parents have expected excellence
    of me. a u o s r n

44. I worry that my feelings will get
    out of control. a u o s r n

45. I think that my hips are too big. a u o s r n

46. I eat moderately in front of others and
    stuff myself when they're gone. a u o s r n

47. I feel bloated after eating a
    normal meal. a u o s r n

48. I feel that people are happiest when
    they are children. a u o s r n

49. If I gain a pound, I worry that I
    will keep gaining. a u o s r n

50. I feel that I am a worthwhile person. a u o s r n

51. When I am upset, I don't know if I am
    sad, frightened, or angry. a u o s r n

52. I feel that I must do things perfectly,
    or not do them at all. a u o s r n

53. I have the thought of trying to
    vomit in order to lose weight.   a u o s r n

54. I need to keep people at a certain
    distance (feel uncomfortable if
    someone tries to get too close).   a u o s r n

55. I think that my thighs are just the
    right size.   a u o s r n

56. I feel empty inside (emotionally).   a u o s r n

57. I can talk about personal thoughts
    or feelings.   a u o s r n

58. The best years of your life are when
    you beome an adult.   a u o s r n

59. I think that my buttocks are too large. a u o s r n

60. I have feelings that I can't quite
    identify.   a u o s r n

61. I eat or drink in secrecy.   a u o s r n

62. I think that my hips are just the
    right size.   a u o s r n

63. I have extremely high goals.   a u o s r n

64. When I am upset, I worry that I
    will start eating.   a u o s r n

65. I feel hungry after a normal meal.   a u o s r n

    This item was added to the EDI to make it more compatible
with an obese rather than an anorexic population. It will be
used to reanalyze data from number 47.

APPENDIX B

WEIGHT LOCUS OF CONTROL SCALE

WEIGHT LOCUS OF CONTROL SCALE

Please circle the answer which most closely describes your belief.

STD=Strongly Disagree, MD=Moderately Disagree, SLD=Slightly Disagree,
SLA=Slightly Agree, MA=Moderately Agree, STA=Strongly Agree

1. Whether I gain, lose, or maintain   STD MD SLD SLA MA STA
   my weight is entirely up to me.

2. Being the right weight is largely   STD MD SLD SLA MA STA
   a matter of good fortune.

3. No matter what I intend to do, if   STD MD SLD SLA MA STA
   I gain or lose weight, or stay the
   same in the near future, it is
   just going to happen.

4. If I eat properly, and get enough   STD MD SLD SLA MA STA
   exercise and rest, I can control
   my weight in the way I desire.

Scoring Key:

1. Internal STD=6, MD=5,..., STA=1 Points
2. External STD=1, MD=2,..., STA=6 Points
3. External STD=1, MD=2,..., STA=6 Points
4. Internal STD=6, MD=5,..., STA=1 Points

171

APPENDIX C

ROTTER'S I-E SCALE

ROTTER'S I-E SCALE

This is a questionnaire to find out the way in which certain important events in our society affect different people. Each item consists of a pair of alternatives lettered a or b . Please select the one statement of each pair (and only one) which you more strongly believe to be the case as far as you are concerned. Be sure to select the one you actually believe to be more true rather than the one you think you should choose or the one you would like to be true. This is a measure of personal belief; obviously there are no right or wrong answers.

Your answer, either a or b to each question on this inventory, is to be reported beside the question.

Please answer these items carefully but do not spend too much time on any one item. Be sure to find an answer for every choice. For each numbered question make an X on the line beside either the a or b , whichever you choose as the statement most true.

In some instances you may discover that you believe both statements or neither one. In such cases, be sure to select the one you more strongly believe to be the case as far as you are concerned. Also try to respond to each item independently when making your choice; do not be influenced by your previous choices.

Remember: Select that alternative which you personally believe to be more true.

I more strongly believe that:

1. __a. Children get into trouble because their parents punish them too much.
   __b. The trouble with most children nowadays is that their parents are too easy with them.

2. __a. Many of the unhappy things in people's lives are partly due to bad luck.
   __b. People's misfortunes result from the mistakes they make.

3. __a. One of the major reasons why we have wars is because people don't take enough interest in politics.
   __b. There will always be wars, no matter how hard people try to prevent them.

4.__a. In the long run people get the respect they deserve in this world.
  __b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.

5.__a. The idea that teachers are unfair to students is nonsense.
  __b. Most students don't realize the extent to which their grades are influenced by accidental happenings.

6.__a. Without the right breaks one cannot be an effective leader.
  __b. Capable people who fail to become leaders have not taken advantage of their opportunities.

7.__a. No matter how hard you try some people just don't like you.
  __b. People who can't get others to like them don't understand how to get along with others.

8.__a. Heredity plays the major role in determining one's personality.
  __b. It is one's experiences in life which determine what they're like.

9.__a. I have often found that what is going to happen will happen.
  __b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.

10.__a. In the case of the well prepared student there is rarely if ever such a thing as an unfair test.
  __b. Many times exam questions tend to be so unrelated to course work that studying is really useless.

11.__a. Becoming a success is a matter of hard work, luck has little or nothing to do with it.
  __b. Getting a good job depends mainly on being in the right place at the right time.

12.__a. The average citizen can have an influence in government decisions.
  __b. This world is run by the few people in power, and there is not much the little guy can do about it.

13.__a. When I make plans, I am almost certain that I can make them work.
  __b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.

14.__a. There are certain people who are just no good.
  __b. There is some good in everybody.

15.__a. In my case getting what I want has little or nothing to do with luck.
 __b. Many times we might just as well decide what to do by flipping a coin.

16.__a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
 __b. Getting people to do the right thing depends upon ability; luck has little or nothing to do with it.

17.__a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.
 __b. By taking an active part in political and social affairs, the people can control world events.

18.__a. Most people can't realize the extent to which their lives are controlled by accidental happenings.
 __b. There really is no such thing as "luck."

19.__a. One should always be willing to admit his mistakes.
 __b. It is usually best to cover up one's mistakes.

20.__a. It is hard to know whether or not a person really likes you.
 __b. How many friends you have depends upon how nice a person you are.

21.__a. In the long run the bad things that happen to us are balanced by the good ones.
 __b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.

22.__a. With enough effort we can wipe out political corruption.
 __b. It is difficult for people to have much control over the things politicians do in office.

23.__a. Sometimes I can't understand how teachers arrive at the grades they give.
 __b. There is a direct connection between how hard I study and the grades I get.

24.__a. A good leader expects people to decide for themselves what they should do.
 __b. A good leader makes it clear to everybody what their jobs are.

25.__a. Many times I feel that I have little influence over the things that happen to me.
 __b. It is impossible for me to believe that chance or luck plays an important role in my life.

26.__a. People are lonely because they don't try to be friendly.
   __b. There's not much use in trying too hard to please people, if
       they like you, they like you.

27.__a. There is too much emphasis on athletics in high school.
   __b. Team sports are an excellent way to build character.

28.__a. What happens to me is my own doing.
   __b. Sometimes I feel that I don't have enough control over the
       direction my life is taking.

29.__a. Most of the time I can't understand why politicians behave the
       way they do.
   __b. In the long run the people are responsible for bad government
       on a national as well as on a local level.

Scoring Key :

Items 1,8,14,19,24, and 27 are unscored filler items.

External Responses:

2.A, 3.B, 4.B, 5.B, 6.A, 7.A, 9.A, 10.B, 11.B, 12.B, 13.B, 15.B, 16.A,
17.A, 18.A, 20.A, 21.A, 22.B, 23.A, 25.A, 26.B, 28.B, 29.A

APPENDIX D

PERSONAL DATA SHEET

<u>PERSONAL DATA SHEET</u>

Please answer each of the following questions to the best of
your ability. All of your responses will be anonymous.
<u>Do not put your name on this sheet.</u> Place your answer to
each question in the blank provided. In some cases you will
write in your own answer. For other items you will select
from the answers provided. When answers are provided,
please place the letter which corresponds to your answer in
the blank to the far right of each question. Feel free to
add your comments about any portion of the questionnaire or
any specific items at the space provided at the end. Please
answer all questions.

1. Code Number   1_____

2. Current Age   2_____

3. Sex (a) Female (b) Male   3_____

4. Height (in feet and inches)   4_____

5. Current Weight (in pounds)   5_____

6. Please describe your bone structure (a) small
   (b) medium (c) large   6_____

7. What is the highest level of education you
   completed?
   (a) elementary school (grades K-6)
   (b) Jr. H.S. (grades 7-9)
   (c) some High School but no diploma
   (d) H.S. diploma
   (e) some college but no Bachelor degree
   (f) technical degree
   (g) Bachelor's degree
   (h) Master's degree
   (i) Doctoral degree
   (j) Other. Please explain _____   7_____

8. Race: (a) White (b) Black (c) Native American
   (d) Hispanic (e) Asian American
   (f) Other. Please specify _____   8_____

9. What is your yearly family income?
   (a) under $10,000   (f) $75-99,999.99
   (b) $10-19,999.99   (g) $100-149,999.99
   (c) $20-29,999.99   (h) $150-199,999.99
   (d) $30-49,999.99   (i) $200,000 or over
   (e) $50-74,999.99   9_____

176

10. Specifically, at what age (in years) did you
    first become overweight? "Overweight" is
    defined as at least 20% over what is considered
    normal for your height and sex.   10_____

    (In case it is difficult for you to remember at
    what age you first became overweight, here are
    some strategies to help you. Thinking about
    the following may help to jar your memory:
    family photographs, report cards, medical
    records, comments made by others about your
    weight, and weigh-ins for school or athletic
    events.)

11. How certain are you of the age you gave in
    number 10? Please choose one of the following
    responses: (a) very certain (b) fairly certain
    (c) somewhat uncertain (d) very uncertain   11_____

12. Did the weight gain described in number 10 occur
    after or during a stressful life event, such as
    the death of a parent or other significant
    person; a move to another city; the divorce of a
    parent, yourself, or other family member; the
    pregnancy of yourself, a spouse or parent; the loss
    of a special relationship; or another
    stressful occurrence? (a) yes (b) no   12_____

13. Please briefly describe the life event from
    number 12:_____

    _____

    _____.

14. Which of the following best describes your
    position in the family in which you grew up?

    (a) There were no children (brothers or
        sisters) younger than I.
    (b) There was one child (a brother or a sister)
        younger than I.
    (c) There were two children younger than I.
    (d) There were three children younger than I.
    (e) There were four children younger than I.
    (f) There were five children younger than I.
    (g) There were six children younger than I.
    (h) There were seven children younger than I.
    (i) There were eight or more children younger
        than I. Please specify number that were
        younger than you:_____   14_____

15. In terms of the amount of weight you have gained
    and lost and/or the number of times you have
    done so, how stable has your weight been?
    (a) very stable (b) somewhat stable
    (c) somewhat unstable (d) very unstable   15_____

16. Are you in a weight-control, or weight-related
    program? (a) yes (b) no   16_____

17. If applicable, please give the <u>name</u> of the
    program(s) and a brief <u>description</u>
    (from number 16). Major programs, Weight
    Watchers, Overeaters Anonymous, TOPS, and NAAFA,
    do not need to be described.
    Name:_____

    Description:_____

    _____

    _____

18. Are you currently dieting? (a) yes (b) no   18_____

19. For how long have you been dieting?
    (a) less than 1 week
    (b) from 1 week up to 2 weeks
    (c) from 2 weeks up to 4 weeks
    (d) from 1 month up to 3 months
    (e) from 3 months up to 6 months
    (f) from 6 months up to 12 months
    (g) 1 year or longer   19_____

Please answer items 20-22. Use the blank sheet provided
    if you need more room.

*20. Briefly, what do you think is/are the reasons <u>you</u> are
    overweight?

*21. Briefly, what do you think is/are the reasons most
    people are overweight?

*22. "Pat grabbed a pair of slacks from the closet. While
    putting them on, Pat noticed how tight they were
    getting." (Please finish this story. Be sure to
    include how Pat felt, what Pat did, and what happened.)

*Note: items 20, 21, and 22 will be used to gather
information for future research

APPENDIX E

RECRUITMENT LETTER TO PARTICIPANTS

Dear   :

    I am a doctoral candidate in Counseling Psychology at Michigan
State University about to begin the research for my dissertation. This
research may be of special interest to you.

    The purpose of the study is to determine personality factors that
relate to obesity. I am asking for "overweight" volunteers to help me
by completing several questionnaires. Participants need to be currently
at least 20% over their ideal weight as indicated on the attached chart.
If you meet this criteria, have never been bulimic, have never suffered
from anorexia nervosa, and are over age 18, I would very much appreciate
your participation.

    While there are no direct benefits to participants for their
involvement in this study, I believe that completing the questionnaires
and receiving a summary of the results will provide an interesting and
thought-provoking experience. Participants may also indirectly benefit
by knowing that they have helped add to our scientific knowledge of this
topic.

    Here is some general information about the procedures of this
study. Completion of the questionnaires will take approximately one
hour. They will be administered in groups or on an individual basis if
needed. While the questions asked are not usually perceived as highly
personal, your individual answers will be totally anonymous. It is not
expected that the questionnaires will be upsetting to participants, but
there is a small risk that some individuals may have negative reactions.
In any event, participants are free to discontinue their involvement at
any time without question or pressure to continue. Before and after the
study, participants will have an opportunity to talk with me and ask any
questions. This is a straightforward study with no deception involved.
A sign-up sheet will be available for participants who wish to receive a
copy of the results of this research.

    We will be meeting at (place) on (day and date) at (time) to
complete the questionnaires. I hope you decide to join me in this
effort to better understand a topic of mutual interest. If this date is
not convenient, please contact me so that other arrangements can be made
(telephone 616-455-8895).

    Please attend. Your help will be greatly appreciated.

Sincerely,

Virginia C. Duerst

P.S. Please see the attached sheet to determine whether you meet the
necessary weight minimum.

APPENDIX F

METROPOLITAN HEIGHT AND WEIGHT CHART

AVERAGE NORMAL WEIGHTS AT
20% OVERWEIGHT BASED ON
HEIGHT, SEX, AND BODY FRAME *

MEN

Height	Small Frame		Medium Frame		Large Frame	
	Average Normal	+20%	Average Normal	+20%	Average Normal	+20%
5'1"	131	157	136	163	144	173
5'2"	133	160	138	166	147	176
5'3"	135	162	140	168	149	179
5'4"	137	164	143	172	152	182
5'5"	139	167	145	174	155	186
5'6"	142	170	148	178	159	191
5'7"	144	173	151	181	162	194
5'8"	147	176	154	185	166	199
5'9"	149	179	157	188	169	203
5'10"	152	182	160	192	173	208
5'11"	155	186	164	197	176	211
6'0"	158	190	167	200	180	216
6'1"	162	194	171	205	185	222
6'2"	165	198	175	210	189	227
6'3"	169	203	179	215	194	233

WOMEN

Height	Small Frame		Medium Frame		Large Frame	
4'9"	107	128	115	138	125	150
4'10"	108	130	117	140	127	152
4'11"	110	132	120	144	130	156
5'0"	112	134	122	146	133	160
5'1"	115	138	125	150	136	163
5'2"	118	142	128	154	139	167
5'3"	121	145	131	157	143	172
5'4"	124	149	134	161	146	175
5'5"	127	152	137	164	150	180
5'6"	130	156	140	168	153	184
5'7"	133	160	143	172	157	188
5'8"	136	163	146	175	160	192
5'9"	139	167	149	179	163	196
5'10"	142	170	152	182	166	199
5'11"	145	174	155	186	169	203

Weights include 5 pounds of clothing for men and 3 pounds of clothing for women.

*This chart was adapted from the 1983 Metropolitan Height and Weight Tables for Men and Women (Metropoliton Life Insurance Company, 1983). An average normal weight was derived from the weight range provided for each height and frame size from this source.

APPENDIX G

INFORMATION AND CONSENT FORM

Information and Consent Form
Michigan State University
Doctoral Research
by V. C. Duerst

1. I understand that this study is being conducted by Virginia Duerst, a doctoral candidate in Counseling Psychology, under the supervision of Dr. Linda Forrest, and that its purpose is to examine personality factors that relate to obesity.

2. This study and its procedures have been explained to me so that I understand the explanation and what my participation will involve.

3. I understand that I am free to discontinue my participation at any time without recrimination.

4. I understand that my individual results will be held in strict confidence. Answer sheets will not ask for my name so that I will remain anonymous.

5. I understand that my participation in the study does not guarantee any beneficial results to me.

6. I understand that a summary of general results of the study will be made available to me at my request.

7. I understand that, at my request, I can receive an additional explanation of this study.

8. I certify that I am older than age 18 and at least 20% overweight as defined by the height-weight chart provided. I have never been bulimic or suffered from anorexia nervosa.

9. I freely consent to participate in this study.

Signature_____ Date_____

If you would like a summary of the results of this study, print your mailing address here:

_____

_____

DETACH THIS FORM FROM YOUR PACKET OF QUESTIONNAIRES SO THAT YOUR RESPONSES REMAIN ANONYMOUS.

APPENDIX H

SUMMARY SENT TO PARTICIPANTS

Dear Research Participants:

I am writing to thank you for your contribution to my dissertation research, and to provide you with a summary of the results of the study.

As you may remember, the purpose of the study was to examine personality variables relevant to obesity. Several authors believe that obesity is not a single disorder, and that clarifying differences among the population may enhance understanding and facilitate treatment. One potentially important difference is the age at which the individual first became overweight; accordingly, differences in personality were examined across all ages of onset.

No significant differences in interpersonal trust, feelings of effectiveness, or interoceptive awareness (ability to read ones internal cues and feelings) were uncovered across the various ages of onset. However, another dimension of personality, locus of control, did vary with age of onset. External locus of control is defined as the belief that events are contingent upon external forces such as luck, chance, fate, or other people, in contrast to internal locus of control, the belief that occurrences are contingent upon ones own actions or characteristics. These variables can be thought of as a continuum, with most individuals falling somewhere between the two extremes. In this study, as hypothesized, a younger age of onset correlated significantly and positively with external general locus of control and external weight-specific locus of control.

Other findings of the study were (a) that individuals with an older age of onset were significantly more likely to report the occurrence of a major stressor at the time of onset and (b) that individuals who were only or youngest children were not significantly more likely to have a younger age of onset than children with another familial rank.

For a more detailed discussion of these findings, interested participants are referred to Michigan State University Library for a copy of the dissertation, titled "Effects of Age of Onset of Obesity on Effectiveness, Interoceptive Awareness, Interpersonal Trust, Global Locus of Control and Weight Locus of Control."

Again, I thank you for your help with this project.

Sincerely,

Virginia C. Duerst

APPENDIX I

PEARSON PRODUCT-MOMENT CORRELATIONAL MATRIX

Pearson Product - Moment Correlational Matrix

	Age	Sex	?D	Ed	Ra	Inc	On	Cert	Stress	Sib	Stab	Cont	Gr	Diet	LOC	MLOC	Dis	Inef	IA	IAR
Age	1.0000																			
Sex	.0212	1.0000																		
?D	-.0578	.1083	1.0000																	
Ed	-.1328*	-.0073	-.0089	1.0000																
Ra	-.0260	.0584	-.0999	-.0423	1.0000															
Inc	.0344	-.0763	-.2511*	.1786*	.0727	1.0000														
On	.3171*	-.0413	-.2737*	-.0399	.1306*	.2082*	1.0000													
Cert	-.0241	-.1064	.0103	-.0349	-.0767	-.1419*	-.0073	1.0000												
Stress	-.0624	-.0507	-.0172	.0114	-.1525*	-.0374	-.2201*	.2028*	1.0000											
Sib	-.0375	.0224	.0031	-.0570	.0735	.0663	.0029	-.0420	.0392	1.0000										
Stab	.0134	.1735*	.1656*	.0246	.0327	.1365*	-.1995*	-.0732	-.1583*	-.0513	1.0000									
Cont	-.0137	-.1234	-.1416*	.1929*	-.0084	-.0646	-.0104	.0573	.0996	.0248	-.2279*	1.0000								
Gr	.0239	-.1337*	-.3177*	-.1281	.1146	.1258	.1649*	-.2060*	.0884	-.0053	.0344	-.0811	1.0000							
Diet	.0250	.1004	-.2002*	-.0995	.0250	-.0134	.0023	-.0872	.0261	-.0162	.2242*	-.3105*	.2659*	1.0000						
LOC	-.1891*	-.0716	.1851*	.0303	-.1293*	-.1563*	-.1409*	.0856	.0607	-.1330*	.0550	-.0100	-.1246	-.0246	1.0000					
MLOC	.0156	.0526	.3097*	-.0125	-.0903	-.1111	-.0738	.2708*	.0899	-.0500	-.0367	-.0740	-.3172*	-.2239*	.3003*	1.0000				
Dis	.0067	-.0620	.0307	-.0224	-.0987	-.0728	.0065	.1254	-.0442	-.0223	-.0896	.0088	-.2430*	.0136	.2134*	.1429*	1.0000			
Inef	.0546	.1266	.2439*	-.0465	-.0551	-.1257	-.0273	.0261	-.0727	.0160	.0653	-.1179	-.3024*	-.0166	.2632*	.1522*	.5792*	1.0000		
IA	.0584	.0597	.1289	-.0695	-.0513	-.0772	-.1099	.0832	-.1217	.0085	.0833	-.2335*	-.3901*	.0279	.1845*	.1650*	.5740*	.6408*	1.0000	
IAR	.0071	.0850	.1121	-.0506	-.0585	-.0639	-.0990	.1037	-.1368*	-.0053	.1222	-.2397*	-.3859*	.0086	.1977*	.1895*	.5412*	.6299*	.9760*	1.0000

* p < .05

Abbreviations Key

Pearson Product - Moment Correlational Matrix

Abbreviation	Variable
Age	Age
Sex	Sex
% O	Percentage Overweight
Ed	Education
Ra	Race
Inc	Income
On	Age of Onset of Obesity
Cert	Certainity of Age of Onset
Stress	Stress at Onset
Sib	Rank among Siblings
Stab	Stability of Weight
Cont	Weight Control Group Member (yes or no)
Group	Group Membership
Diet	Dieting Status (length of time dieting)
LOC	Locus of Control
WLOC	Weight Locus of Control
Dis	Interpersonal Distrust
Inef	Ineffectiveness
IA	Interoceptive Awareness
IAR	Interoceptive Awareness - Revised

APPENDIX J

LIST OF STRESSORS AT ONSET

List of Stressors at Onset

<u>Single Stressors at Onset</u>

Pregnancy 21

Onset of menstruation   1

Illness   1

Hysterectomy   1

Major surgery   1

Heart problem   1

Relocation   7

School transfer   2

Started college   1

Stress at work   1

Changed employment   1

Adolescence   1

Death of mother   2

Death of father   2

Death of sister   1

Parental conflict   1

Conflict with mother   1

Childcare responsibility   2

Marital separation   1

Loss of friend   1

Sexual molestation   1

Therapy (for previously experienced incest and sibling
    death) 1

Multiple Stressors at Onset

Pregnancy, married because of it

Pregnancy, thyroid problems

Pregnancy, suicide attempt of sister

Cesarean delivery, death of child

Miscarriage, surgery, child had broken leg, building house

Difficult childbirth, child's health problems

Childbirth, relocation, loss of special relationship

Tonsilectomy, parental criticism

Hysterectomy, loss of special relationship, death of mother

Major illness, illnesses of family members, father's
    alcoholism

Father's illness, married a cook, returned to school
    as an adult

Death of parents, relocation

Marital conflict because of husband's alcohol abuse,
    son's drug abuse

Divorce, brother's violence, brother's death

Parental divorce, several relocations, abuse by stepfather

Parental divorce, moving in with aunt

Marriage, relocation

Quit job, relocation

Relocation, lived alone

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188

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