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Self-Consciousness and Body Image Issues Among College Females

Mary E. Doty
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SELF-CONSCIOUSNESS AND BODY IMAGE ISSUES
AMONG COLLEGE FEMALES

by
Mary Elizabeth Doty

A dissertation submitted in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

in
Psychology

Approved:

UTAH STATE UNIVERSITY
Logan, Utah

1990
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Mary Elizabeth Doty
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ABSTRACT

Self-Consciousness and Body Image Issues Among College Females

by

Mary E. Doty, Doctor of Philosophy

Utah State University, 1990

Major Professors: Gerald R. Adams, William R. Dobson
Department: Psychology

This study examined some of the procedures used in eating disorder research. Body size estimation procedures, in light of their similarity to procedures in social psychology, were used to create self-focus and self-consciousness conditions. If the procedures in the present study create self-consciousness effects, it is possible that the results of those studies have been affected by a heightened state of self-awareness. The present research also explored the relationships between self-consciousness, self-esteem, body esteem, body perception, and eating disorder proneness.

The research was conducted with a nonclinical sample from a university population, controlling for age and body development factors. Baseline and experimental measures of objective self-awareness and body size perception were taken. The experimental conditions consisted of the presence of a) a VCR and mirror and b) an observer who was
rating the subject. The third condition was a control setting that replicated the baseline setting. The sample was also tested at the posttest for self-esteem, body esteem, and eating disorder proneness.

The results indicate that the subjects reported no significant changes in self-consciousness or body size estimates, suggesting that something besides the presence of equipment influences whether or not one feels self-conscious. This idea has been borne out in other research that implicates self-esteem as a major consideration in whether or not an individual feels self-conscious in certain situations (that is, that low self-esteem appears to increase one's amenability to induce self-consciousness). Another primary factor is that self-consciousness cannot be induced when the individual is interested in the task. Subjects in the present study indicated that they found the tasks inherently interesting and forgot about the presence of equipment and observers once they began thinking about the questions posed to them. In the present research, self-esteem and body esteem were both found to be negatively related to self-consciousness, while eating disorder proneness was found to be positively related to self-consciousness. The results are discussed in light of these connections, and suggestions for future research are provided.
CHAPTER I

INTRODUCTION

Statement of the Problem

Over the past four decades, the incidence of diagnosed eating disorders (anorexia nervosa and bulimia nervosa) has been on the rise (Mitchell & Eckert, 1987). Once a relatively rare condition, anorexia nervosa is now estimated to affect up to 4% of the female college population in the United States (Pope, Hudson, & Yurgelun-Todd, 1984). Likewise, the prevalence of bulimia nervosa has been estimated at levels of from 8 to 19% among college women (Halmi, Falk, & Schwartz, 1981; Mitchell & Eckert, 1987; Pyle et al., 1983). These conditions are far more common in women than in men, at estimated rates of approximately 10 to 1 for anorexia and 20 to 1 for bulimia (Anderson, 1981).

Of primary concern regarding eating disorders is the serious health compromises that often result, affecting multiple body systems (Kaplan & Woodside, 1987). In fact, the mortality rate for diagnosed anorexic patients has been reported to approach 5% (Szmukler & Russell, 1986). In addition to the physical problems, there are a number of atypical psychological conditions that appear to be involved in eating disorder syndromes. Some of these psychological conditions may be life-threatening in their own right. One such condition is gross body image distortion.
In the past 20 years, particular attention has been given to the disturbances in body image perception evidenced among many individuals with eating disorders. These body image disturbances (BID) are sometimes so great as to be delusional in nature (Bruch, 1973; Fisher, 1986; Shontz, 1969). It has been suggested that BID is related to the maintenance of such life-threatening behaviors as self-starvation and frequent purging (Bruch, 1973; Garner, 1981; Polivy & Herman, 1985; Williamson, Kelley, Davis, Ruggiero, & Blouin, 1985; Wilson, 1984). Bruch (1973, 1981) has argued that body image perception is a prognostic indicator, noting that eating disordered patients who maintain distorted body images are more likely to relapse after treatment than those who achieve realistic images of themselves.

Although most experts concur that BID is usually present in individuals with eating disorders, confusion as to the nature and scope of this phenomenon still exists (Bell, Kirkpatrick, & Rinn, 1986; Ben-Tovim, Whitehead & Crisp, 1979). The Diagnostic and Statistical Manual-III-Revised (American Psychiatric Association [APA], 1986) lists BID as a diagnostic criterion for anorexia nervosa but not for bulimia nervosa. Some research has indicated that BID also occurs in bulimia nervosa (e.g., Powers, Schulman, Gleghorn, & Prange, 1987; Williamson et al., 1985) as well as in obesity (e.g., Bell et al., 1986; Young & Reeve,
1980). Some studies with anorexic subjects have yielded equivocal results, with anorexics not appearing substantially different from controls on some BID measures (e.g., Casper, Halmi, Goldberg, Eckert, & Davis, 1979; Strober, Goldenberg, Green, & Saxon, 1979).

Additionally, there are several problems with the existing research on BID in eating-disordered samples. Many studies have not controlled for the possible effects of age on body perception (Montemayor & Eisen, 1977). There are very few studies that have examined BID in nonclinical populations, even though several researchers have pointed to a need for such normative investigations (e.g., Gray, 1977; Shontz, 1969). Furthermore, there has been little agreement in the literature on how best to measure BID. Methods have ranged from projective techniques and inferred measures to sophisticated photographic distortion techniques, each method presenting its own set of experimental difficulties (Bell et al., 1986; Fisher, 1986; Garner, 1981).

Finally, although body image estimate is clearly a matter of perception, specifically self-perception, the majority of this research has tended to treat superficially the area of perception as it relates to BID. One factor that has been convincingly demonstrated to reliably affect self-evaluation and perception is objective self-awareness [OSA] (Duval & Wicklund, 1972). It is this aspect of perception that was focused upon in the present study, due
to the possibility that research procedures and recently developed BID measurement techniques may induce heightened states of OSA. Increased levels of OSA could, hypothetically, affect the outcomes of some BID research, particularly in subjects who have lower-than-average levels of self-esteem (e.g., Brockner, 1979; Duval & Wicklund, 1972). This is important to the study of BID in eating-disordered samples because of the suggested link between low self-esteem and incidence of eating disorders (e.g., Bruch, 1973; Dykens & Gerrard, 1986; Williamson et al., 1985).

Given the seriousness and incidence of eating disorders as well as the physical impact of BID on this group, there is a need for further investigation of body image perception in both nonclinical and clinical populations. This research should include adequate controls for extraneous variables such as age (Montemayor & Eisen, 1977), self-esteem (Rosen & Ross, 1968), and laboratory characteristics such as audience effects and effects of intimidating equipment and procedures (Bell et al., 1986; Wingate & Christie, 1978). The present research attempted to address some of the potentially confounding variables in measurement through further experimental assessments.

First, the current study controlled for the variable of age by using subjects between the ages of 18 and 35, thus ruling out the possibility of pubertal or aging effects on body perception. The study also took self-esteem into
account by using a measure of self-esteem as one of the dependent variables (posttest only). Body esteem and eating disorder proneness were used as dependent variables (posttest only) for between-group comparisons. Finally, one of the primary concerns of the study was to test whether or not an observer/rater and VCR/mirror feedback produced changes in self-consciousness or in body size estimates for a general, female college population.

Definition of Terms

Some of the terminology used in this study has been applied to a variety of phenomena. For the purpose of clarity in the present research, the following terms have been defined accordingly:

1. Body image - a generic term referring to subjective perception of one's own body and expressed feelings and thoughts related to one's own body.
2. Body size estimation - the estimate given to one's perception of actual body size on a measure of size estimation such as width, shape, and height.
3. Body image distortion - changes in subjective perception of one's own body size.
4. Body image discrepancy - notable difference between one's own perception of body size and that of an objective observer.
5. Body image disturbance - a notable difference between one's own perception of or subjective thoughts and feelings about one's own body and those of an objective observer.

6. Body esteem - the presence of positive or satisfied thoughts and feelings about the acceptability of one's own body.

7. Self-esteem - the presence of overall positive or satisfied thoughts and feelings about the acceptability of one's self (including one's accomplishments, self-security, social acceptability, and personal acceptability).

8. Self-image - the way in which one views one's self as a global, integrated individual both in relation to the self as well as to others.

9. Eating disorder proneness - a trend toward the attitudes, feelings, and behaviors of diagnosed eating disorder (in this case, as measured by the Eating Disorder Inventory).
CHAPTER II

REVIEW OF THE RELEVANT LITERATURE

The following review of literature begins with a discussion of the construct of body image and proceeds to a description of the existing research on body image disturbance in eating-disordered individuals. A comprehensive treatment of objective self-awareness theory and research ensues. Finally, the review presents several difficulties that exist in the study of body image disturbance given the current state of knowledge in the three preceding areas.

Body Image

Body image is more a matter of perception, colored by personality and culture, than it is a matter of "fact." Perception of one's body is influenced by a complex web of subjective recollections, estimations, and experiences (Bruch, 1973; Fisher, 1986; Schilder, 1935; Shontz, 1969). Most humans experience some initial surprise upon seeing themselves unexpectedly in a mirror or photograph and tend to scrutinize themselves more closely than they do other people (Fisher, 1986). It may even be the case that, under some conditions, many individuals experience some perceptual distortion of their body images. However, while most
distortions are minor and can generally be reconciled, there are some individuals who exhibit such gross distortions of their body images that their physical health and personal relationships are seriously endangered.

Schilder has given what is generally considered to be the working definition of body image (Bruch, 1973): "the picture of our own body which we form in our mind, that is to say the way in which our own body appears to ourselves" (1935, p.11). Fisher (1986) says that the body is viewed as the core of one's identity such that "self concept is wrapped around the piece of space labeled as 'my body'" (p. 79).

The individual initially uses the body as the sole means of relating both to the self and to others. With the establishment of a sense of identity through mastery (Piaget, 1954), with the development of cognitive skills, and with an increased field of relationships and experiences, the normally developing person moves away from identity focused on physical attributes to one centered on social and psychological constructs (Montemayor & Eisen, 1977; Piaget, 1954). For example, Montemayor and Eisen (1977) found that while 10-year-old children use physical self-descriptions, those in succeeding age groups use more psychological and social self-descriptions.

Body image begins as a relatively global concept, lacking differentiation, and moves toward articulation and
differentiation (Fisher, 1986; Piaget, 1954; Shontz, 1969; Witkin, Goodenough, & Oltman, 1979). Paterson and Witkin (1970) demonstrated that body articulation, as measured by figure drawings, increase reliably with age, although this may be somewhat affected by increasing drawing abilities with maturation.

Koff, Rierdan, and Silverstone (1978) found that for females, some changes in body image perception appear to coincide with menarche. They concluded that menarche is a major event around which a reorganization of sexual identity and body image generally occur. Thus, during that period of time in adolescence associated with puberty, body image may be unstable for most females. This proposition is partially supported by results presented by Leon, Bemis, Meland, and Nussbaum (1978), who, after studying body image in obese and normal-weight children (ages 13-18), concluded that body image seems to be more a function of age than weight status in that particular age group. Halmi, Goldberg, and Cunningham (1977) observed similar age-related findings. While body image is not likely to be solely a function of age, it is probable that age does figure in as an important factor when discussing body image distortion, where it is assumed that the body image at some point becomes stable.
Body Image Disturbance in Eating Disorders

Morton (1694) gave the first known descriptive account of anorexia nervosa. Almost two centuries later, very similar accounts were offered by Gull (1868), Lasegue (1873), and Charcot (1889). Still another century later, these descriptions are strikingly familiar, resembling current accounts of the disorder that are generally accepted as primary diagnostic features by the APA (1986). Besides the clinical hallmark of self-starvation, one agreed-upon symptom of anorexia nervosa is severe body image disturbance. Anorexic persons are said to grossly overestimate their sizes, reporting that they feel fat even when emaciated and in the face of evidence to the contrary (APA, 1986).

Many studies have undertaken to confirm the presence and role of body image distortions among anorexic populations. Unfortunately, results have not been uniform. Two relatively early studies (Kalucy et al., 1975; Slade & Russell, 1973) indicated that anorexics report self-estimates of body width that are dramatically inflated. Pierloot and Houben (1978) compared a female anorexic group to a female psychoneurotic control group, finding greater tendencies to overestimate body size among anorexics than controls. They also noted that the anorexic subjects were
more inconsistent in their estimations of body size than were control subjects. Similar results were obtained by others (Bell et al., 1986; Ben-Tovim et al., 1979; Freeman, Thomas, Solyom, & Miles, 1983; Garfinkel, Moldofsky, Garner, Stancer, & Cosina, 1978; Leon, Lucas, Colligan, Ferdinande, & Kamp, 1985; Wingate & Christie, 1978).

Less conclusive results have been reported by Touyz, Beumont, Collins, McCabe, and Jupp (1984), who noted that anorexic subjects tend to either overestimate or underestimate body size, providing some support for the belief that anorexic subjects exhibit greater variation in their body image estimates than controls (Pierloot & Houben, 1978).

In a study that examined the stability of body image distortions in anorexic and control subjects (Garfinkel, Moldofsky, & Garner, 1979), overestimates of body size in the anorexic group remained stable over the course of a year and were not influenced by changes in weight. This finding supports the role of normalized body image in complete recovery from an eating disorder. It suggests that a realistic body image must accompany other signs of remission for actual recovery to occur (Bruch, 1973, 1981; Garfinkel, 1981; Garner, 1981).

Less substantiating results were found by Casper et al. (1979) and by Strober et al. (1979). Both studies reported that control groups as well as anorexic groups overestimated
body size. However, Strober et al. also found differences between anorexics and controls in body estrangement, body-sensation insensitivity, and body-boundary weakness, with anorexics exhibiting significantly greater tendencies in all areas. They also found within the anorexic group that for those subjects who purged, greater body image distortions were observed. The absence of significant results between anorexic and control subjects could have been due to difficulties with the methodologies rather than an absence of relationship. Both studies, for instance, used adolescent subjects, even though it is possible that body image is not stable in adolescent females (Montemayor & Eisen, 1977). Furthermore, one of the studies (Strober et al., 1979) used human figure drawings to estimate body image disturbance, a method considered by many to be inappropriate for that purpose due to the inferences that are required (Fisher, 1986).

Bulimia nervosa has only been distinguished as an entity separate from anorexia nervosa since its appearance in the DSM-III (APA, 1980). Although there are similarities between anorexia and bulimia, the primary feature in bulimia is recurrent episodes of binge eating followed by some kind of purging activity. As such, it is only distinguishable from compulsive eating that precipitates and sustains simple obesity by the presence of purging, a distinction that may be somewhat artificial (Grace, Jacobson, & Fullager, 1985;
White & Boskind-White, 1981). Compulsive overeating has only recently been seen as a psychological disturbance, having previously been viewed as a statement of failing morals or poor willpower (Chernin, 1982). Stunkard (1959) was the first to specify the features of binge eating as such, with the primary criterion being the ingestion of large quantities of food over a short period of time and a subjective sense of this behavior as being uncontrollable.

Although the concept of body image disturbance is absent in the diagnostic features for bulimia in the DSM-III-R (APA, 1986), there is considerable evidence that such disturbances do exist and may be as severe as those noted in anorexia nervosa (Striegel-Moore, Silberstein, & Rodin, 1986). Several studies have indicated that bulimics who purge have lower self-concepts and greater body image disturbances than controls (Dykenes & Gerrard, 1986; Polivy & Herman, 1985; Striegel-Moore et al., 1986; Strober et al., 1979). Williamson et al. (1985) found similar results not only in terms of body image but in other manifestations of psychopathology as well; i.e., that bulimics are "more depressed, more anxious, and generally more neurotic and impulsive" (p. 161). In a study of binge eating by Wolf and Crowther (1983), non-purging bulimics had anorexic-like attitudes about eating, were dissatisfied with their bodies, and had poorer self-images. These features were shown to reliably predict the severity of the subjects' binge
patterns. Furthermore, Ihanus (1984) demonstrated that morbidly obese patients score higher than the reference value on the Rorschach test (Exner, 1974) in anatomical responses, indicating a preoccupation with body and disordered body image.

Some studies with obese subjects found that overweight persons, particularly females, have variability between real and ideal body images, results that are similar to findings with anorexic subjects (DelRossario, Brines, & Coleman, 1984; Hendry & Gillies, 1978; Jacobs & Wagner, 1984; Mendelson & White, 1982; Pierloot & Houben, 1978; Storz, 1982). Additionally, it has been suggested that in order for obese individuals to lose weight and maintain that loss, their body images must be relatively normal; that is, consistent with their actual body sizes (Bruch, 1973 & 1981; Jupp, Collins, McCabe, Walker, & Diment, 1983; Leitner & Grant, 1982; Stunkard, 1959). Further, Young and Reeve (1980) convincingly demonstrated, via 100% accuracy in reclassification of percent body weight with body image, that body image is an important variable in distinguishing between those with high versus low body-fat levels.

While it seems clear that body image disturbance is usually present in eating disorders, enough inconsistencies exist to warrant a closer look at the problem. Some have suggested that variations in findings could be due to eating-disordered individuals wanting to appear better than
they are or to their sensitivity to intimidating laboratory equipment and procedures (Wingate & Christie, 1978; Fransella & Crisp, 1979). Wingate & Christie suggested that this tendency may be related to low self-esteem, a concomitant external locus of control, and a desire to be approved of by others.

Objective Self-Awareness

Over time, human beings, both individually and collectively, have been the objects of their own observations. Philosophers and scientists alike have been intrigued with the form and substance of the self, and many have undertaken to explain that construct. It has been speculated that it is the proclivity for self-surveillance that separates Homo sapiens from the rest of the animal kingdom.

Whether or not this is the case, there has been, in modern times, a flurry of research endeavor around theories of the self, prompting individuals, such as C. H. Cooley, Sigmund Freud, William James, George Herbert Mead, and many others, to explore in greater detail the nature of the self. The theory of objective self-awareness (OSA) presented by Duval and Wicklund (1972) came from some of those pioneers.

George Herbert Mead, in his treatise: Mind, Self and Society (1934), discussed in an exhaustive manner the
concept of the self. He asserted that the sense of self is something that is not present at birth but rather "arises in the process of social experience and activity" (p. 135) and proceeds to develop over time). Mead further wrote of the developing self as an increasingly sophisticated organization of experiences, quite distinct from the physical self. The most important distinction for this discussion is the capacity of the self to be an object unto itself. That one can be conscious of oneself as an object seems an obvious point and one that might be easily taken for granted. It is, however, the essence of self-concept and the foundation of objective self-awareness.

Piaget (1954) made a point similar to Mead's, contrasting egocentrism with self-consciousness. He defined egocentrism as a state characterized by a lack of psychological differentiation between self and others, including an assumption by the individual that his/her thoughts and deeds are right. There is an absence of need to verify self-assertions or examine self-contradictory acts. Conversely, Piaget asserted, in the state of self-consciousness, there is an awareness of the self as different from others and with that awareness a realization that the self is both unique and fallible.

Building upon the ideas of Mead and Piaget, Duval and Wicklund (1972) proposed a distinction between two types of self-awareness: "subjective" and "objective."
"Subjective self awareness" is a state of consciousness in which attention is focused on events external to the individual's consciousness, personal history, or body, whereas "objective self awareness" is exactly the opposite conscious state. Consciousness is focused exclusively upon the self and consequently the individual attends to his conscious state, his personal history, his body, or any other personal aspect of himself. (p. 2)

Similar distinctions have been proposed by others. Rotter (1966), for instance, presented a theory of external versus internal locus of control. However, in Rotter's theory, the constructs of internal and external control are seen as relatively stable traits, whereas Duval and Wicklund have contended that such states are fairly transitory and can be situationally induced. This assertion has spawned numerous studies examining the experimental manipulation of OSA.

Early evidence in support of the basic propositions regarding OSA came from Cottrell, Wack, Sekerak, and Rittle (1968); Morse and Gergen (1970); and Sarnoff and Zimbardo (1961). These early studies provided evidence that self-evaluation is more negative during states of high OSA than during states of low OSA, particularly when discrepancies in the self are more pronounced (Duval & Wicklund, 1972). In these studies, states of OSA were induced by the presence of an audience (Cottrell et al., 1968; Sarnoff and Zimbardo, 1961), audio taping and replaying of the subject's voice (Ickes, Wicklund, & Ferris 1973), social comparison (Morse
and Gergen, 1970), and the presence of a television camera and mirror (Duval & Wicklund, 1972). More recently, two of these strategies to induce OSA have been used consistently: the mirror (e.g., Brockner, Hjelle, & Plant, 1985; Carver, 1975; Gibbons, 1983; Scheier, Carver, & Gibbons, 1979) and an audience (e.g., Carver & Scheier, 1978; Shrauger, 1972).

Since Duval and Wicklund first presented their theory of OSA, the research in that area has moved in several different directions. The foci have included behaviors (e.g., Gibbons & Wicklund, 1982), cognitions (e.g., Scheier & Carver, 1980), and affect (e.g., Scheier & Carver, 1977). With all this divergence, however, the basic proposition remains the same: self-awareness is enhanced by self-focused attention. Several studies have demonstrated that accuracy of self-reports (i.e., the correlation between self-reported attitudes and actual behavior) is greatly increased in states of high OSA (Carver, 1975; Gibbons, 1978; Pryor, Gibbons, Wicklund, Fazio, & Hood, 1977; Scheier, Buss, & Buss, 1978; Turner, 1978). Other research has shown that subjects with low self-esteem are more susceptible to the effects of OSA than those with medium or high self-esteem (Brockner, 1979; Brockner et al, 1985; Brockner & Wallnau, 1981; Shrauger, 1972). Gibbons, Carver, Scheier, and Hormuth (1979) found evidence that induced OSA tends to minimize "placebo" effects, an idea suggested earlier by Rickels (1968), who found that patients who are
less somatically focused are more likely to report feeling better following treatment.

According to OSA theory, when an individual is self-aware his/her attention is generally drawn to the aspect of the self that is seen as the most prominent in the particular situation. A process of self-evaluation then begins that leads to greater attempts by the individual to make that dimension of the self more congruent with the related value or standard held by that individual (Carver, 1975; Duval & Wicklund, 1972; Gibbons, 1978; Gibbons & Wright, 1983). This means that when values conflict with behavior, one will be motivated to resolve that discrepancy. One way of reducing that conflict might be to perceive oneself differently. Gibbons and Wright (1983) extended this part of OSA theory by providing support for the idea that while OSA may increase one's tendency to conform to a social standard, the individual's own standard may be only modified and not abandoned.

A related but distinct study by Plant and Ryan (1985) demonstrated that intrinsic motivation is negatively impacted by public self-consciousness, social anxiety, induced OSA, and induced ego-involvement. Non-OSA conditions and private self-consciousness have no apparent impact. This indicates that certain aspects of self-focused attention may be related to a style of self-regulation that is not autonomous, but rather is externally controlled
(Plant & Ryan, 1985). For instance, some anorexics seem to show increased externality, which appears to be related to increasing age, specific clinical symptoms, and personality features (Hood, Moore, & Garner, 1982).

Still other research has suggested that OSA is implicated in the power of expectations to change behavior. When OSA leads the individual to compare current behavior with personal and social norms and the behavior in question does not match the standard, the individual assesses how likely it is that this discrepancy can be reduced. The resultant outcome expectancy can either be positive or negative. If positive, there will be further attempts to reduce the incongruence; if negative, there will be either a mental or behavioral disengagement (Jacobs, Prentice-Dunn, & Rogers, 1984; Prentice-Dunn & Jacobs, 1986). That is, if individuals believe it is possible to successfully act in ways that reduce the discrepancy, they are likely to continue active attempts to do so. If, on the other hand, individuals perceive the task of discrepancy reduction to be too great, they will physically or emotionally remove themselves from a situation they view as being hopeless.

Although it seems fairly clear that induced OSA has an impact on at least some individuals, there is some disagreement about the direction of that impact. As stated earlier, several studies have suggested that OSA tends to increase the accuracy of self-reports and that the effects
of OSA are seen primarily in those with low self-esteem. Ickes et al. (1973) reported, however, that the low self-esteem reported by subjects is induced by the OSA conditions, reflecting the notion that OSA is a self-critical state. They also noted that OSA produces decreased self-esteem when subjects are given negative feedback and increased self-esteem when given positive feedback. When self-aware, some individuals seem to give more credence to external sources of feedback than to their own judgements. This finding supported research noted earlier concerning both externality and social comparison.

Some research has related self-esteem and body esteem to each other (Rosen & Ross, 1968; Zion, 1963) and to OSA (Korabik & Pitt, 1980). Other research has related self-esteem and/or body esteem to eating disorders and BID (e.g., Dykens & Gerrard, 1986; Polivy & Herman, 1985). Garfinkel et al. (1978) introduced the use of a mirror during BID research employing a distorting photograph measurement technique on the basis of previous findings by Grinker (1973) but with no theoretical explanation for doing so. Grinker found that adult-onset obese subjects improved their body size estimates when viewing themselves in a mirror. Garfinkel et al. hypothesized that including the mirror would lessen BID in anorexic subjects but found no evidence of this and concluded that the divergent results were due to the difference in measuring devices. (Grinker used the
moveable caliper technique. He also used obese subjects.) However, the question that has yet to be addressed in the literature is whether any relationship exists between OSA and BID and under what conditions, if any, the relationship might exist.

Problems in the Research on BID in Eating Disorders

One of the major difficulties in studying body image in any population is that of instrumentation. Early studies in body image measurement used projective tests (such as the Draw-A-Person), with relatively little evidence of reliability or validity. Numerous studies have been conducted using the Secord Homonym Test (Secord, 1952-1953). While reliability data are available on the test, there is some question of its use to determine actual BID because it involves a word-association procedure. Although the Secord test has been shown to have reportedly high interrater and split-half reliability (Jupp, 1968; Secord, 1952-1953), it is more accurately an index of body esteem or body concern, which may be related to but not synonymous with BID.

Although the Rorschach, which has better validity and reliability than most projectives (Exner, 1974), has been used on occasion, most of the other projective measures have been less well developed. These measures have included figure drawings, word associations, sentence completions,
and tests of field dependence (Freeman et al., 1983). Although it makes some intuitive sense to use a projective measure when examining a concept as subjective as body image, it is probably not the best form of assessment to employ.

Other studies have used apparati that involve making measurement estimations of individual body parts (e.g., width of head, shoulders, chest, waist, etc.). The use of these parts-estimation measures is questionable because some research has indicated that both experimental and control groups systematically overestimate individual body parts (Fisher, 1986; Garner, 1981).

The trend in measuring body image has been toward a more Gestalt approach, where the body image is considered as a whole rather than in isolated parts. One frequently used method (Askevold, 1975) has attempted to measure body image by requiring one to stand in front of a long sheet of blank paper, imagine oneself before a mirror, and point with a marker to identify where one sees oneself. Although this has been used in several recent studies on body image, adequate controls and statistical analyses of results have been lacking. Garner (1981) criticized Askevold's measure as awkward and unreliable. A related technique is that of the moveable caliper, which involves self-estimates of the width or depth of particular body aspects from two spacial reference points (Slade & Russell, 1973).
A more accurate measure of body image has involved the use of drawings or silhouettes of several body shapes (widths), from extremely thin to obese (e.g., Bell et al., 1986; Fallon & Rozin, 1985). This method gives the subject a choice from a number of discrete stimuli and may therefore control for the tendency to overestimate (Fisher, 1986). It is also a simple and unimposing method, unlikely to sensitize subjects to laboratory procedures.

Recently two similar methods have evolved that are more technologically advanced than previous measures. The general concept is to distort, by way of an amorphic lens or electronic device on a video camera, the actual image of the subject such that the distorted image may range from 20 percent to +20 percent of the actual image (Allebeck, Hallberg, & Espmark, 1976). Another method involves a distorting mirror which operates in much the same way as the distorting camera technique (Shipman & Sohlkah, 1967). These methods provide a discrete measure of actual body image, as well as a precise reporting of the discrepancy between real and perceived body image. However, considering the OSA literature which has reported the use of the video camera and mirror to induce OSA, the presence of this equipment may predispose subjects to states of OSA, thus potentially altering responses. Given the problems of insufficient objectivity on one hand and increased potential for instrument reactivity on the other, the present research
employed the Silhouette Measurement Inventory (Bell et al., 1986) as a reasonably objective yet unimposing measure.

Another problem, which is directly related to the study of eating disordered populations, is that individuals with these disorders tend to have lower self-esteem than the general population (Bruch, 1981; Dykens & Gerrard, 1986; Grace et al., 1985). The impact of this diminished self-esteem is that a tendency to be more externally controlled and thus, more highly sensitive to the demand characteristics of the research environment; i.e., they will want to please the experimenter (Fransella & Crisp, 1979; Rost, Neuhaus, & Florin, 1982; Wingate & Christie, 1978). The implication of this phenomenon is that researchers must take extra care to make the laboratory setting as nonthreatening and unbiased as possible. It is difficult to tell to what extent the existing research has taken this confounding factor into account.

A further difficulty in some of the research is that many studies have used adolescent subjects. It has already been established that body image is part of a developmental process and therefore may change over the course of time. This normal fluctuation in the body image of adolescents, particularly females, seems to stabilize later on. Since it would appear that the individual's self-identity solidifies sometimes after the onset of puberty, the use of adolescent subjects potentially complicates any data obtained from them.
regarding body perceptions (Garner, 1981; Hendry & Gillies, 1978; Leon et al., 1985; Montemayor & Eisen, 1977; Piaget, 1954). Because the body image seems to fluctuate normally in most individuals during or before adolescence, it is doubtful that simply using age-matched controls in adolescent populations is a sufficient intervention in body image research (Fisher, 1986).

Finally, there is considerable contradiction in the literature regarding body image and BID. Weiss (1986) stated:

There is much disagreement on a number of issues, including: the definition of body image, how body image is formulated, the relationship of body movement to body image, the development of body-image disturbance; the effect of weight loss on body-image disturbance (some people who lose weight still regard themselves as fat); and whether it is "pathologic" or "normal" for all populations - normal weight, obese, anorexics - to overestimate or underestimate their body image. In essence, if everyone is suffering a body-image disturbance, can it be pathologic? Other conflicting areas include: the fixation of body-image disturbance and age of onset of obesity; and the question of whether obese people characterize themselves as fat. (p. 521)

Thus, although there has been a great deal of research regarding the study of body image as it is related to eating disorders, there are diverse opinions as to the nature and scope of the problem. It is necessary to continue the investigation of the body image construct, with both eating-disordered and non clinical groups.
Statement of Objectives

The prime objective of the current work was to examine some of the potential difficulties in studying body image perception, particularly with eating disordered subjects. The foremost concern was whether or not some of the procedures used in eating disorder research could inadvertently create heightened states of objective self-awareness (i.e., self-consciousness), which in turn might influence self-perception and self-report. This was considered to be an important issue, given that the procedures used to assess body size distortion have evolved into the manipulation of mirrors and video equipment and objective observer ratings: procedures that have also been used in social psychology research to induce heightened states of objective self awareness. In light of this concern, a secondary objective was to examine what impact heightened self-consciousness might have, should the procedures have had the hypothesized effect.

In addition, the current study intended to examine whether differences in level of self-consciousness existed between the two experimental conditions that could be relevant to the eating disorder research. Both changes in level of self-consciousness and in body size perception were viewed as indices of heightened self-awareness and
perceptual changes under self-focused conditions.

Finally, the study was designed to explore the relationships between self-esteem, self-consciousness, body esteem, body perception, and eating-disorder proneness. These were essential elements, due to connections made by several researchers between self-esteem and ability to be made to feel self-conscious, as well as to the generally accepted beliefs that self-esteem is related to body esteem and possibly to body perception, as well as to eating-disorder proneness.

Research Design and Hypotheses

Study 1

The first study was a preliminary one, designed to assess the test-retest reliability of the Silhouette Measurement Instrument (SMI) developed by Bell et al. (1986). The SMI was the dependent measure in this study. The second purpose of the study was to establish preliminary data for the USU female population on two other measures: one of self-esteem (Self Attitude Inventory [SAI]) and the other of body esteem (Body Esteem Scale [BES]).

With regard to the SMI, it was hypothesized that the scale would be stable (i.e. no significant difference) from test to retest. The SAI and BES were included in order to obtain descriptive and reliability data only.
Study 2

Study 2 was the main study in the present investigation. It was designed to test some of the procedures used in eating disorder research on body size estimation in order to determine whether or not these procedures could create heightened states of OSA, which might in turn (according to the OSA literature) change self-reports (of body size, in this case). This research was preliminary as well, because eating-disordered subjects, although probably included in the general population and sample, were not examined separately from the non-eating-disordered subjects.

The independent variables in Study 2 were two experimental conditions (vcr/mirror and observer/rater). These conditions were patterned after typical eating disorder research on body size estimation, and were also similar to some of the conditions used in other literature to induce OSA. There was a control group as well, which was not subjected to either of the hypothetical OSA-inducing situations.

Two of the dependent variables for the present research were: (1) amount of BID ([SMI], Bell et al., 1986) and (2) level of OSA ([SCSR], Fenigstein, Scheier, & Buss, 1975; Scheier & Carver, 1985). Fundamentally, this part of the research was a "pretest-posttest control group design" (Borg
& Gall, 1983, p. 650). Subjects were randomly assigned to one of two experimental groups or the control group.

There were three other dependent variables for which a "posttest-only control-group design" was employed (Borg & Gall, 1983, p. 670). These variables were: (1) self-esteem ([SAI], Lorr & Wunderlich, 1986), (2) body esteem ([BES], Franzoi & Shields, 1984) and (3) eating disorder proneness ([EDI], Garner et al., 1983).

There were five experimental hypotheses in the present research:

1. It was the experimental hypothesis that OSA would be induced in the two experimental groups such that scores on the SCSR (dependent measure of OSA) would increase from pretest to posttest in vcr/mirror and observer/rater groups but not in the control group.

2. Changes in scores on the SMI from pretest to posttest would correspond to changes in the SCSR, such that SMI scores would change significantly in the experimental groups, but not in the control group. It was anticipated that the direction of change in the SMI would be an increase in score (reflecting a larger body size estimate).

3. The three groups would differ on their SMI distortion scores (SMI posttest minus SMI pretest scores) such that the control group would have significantly lower distortion scores than
experimental groups and that the experimental groups would differ from each other in either magnitude or type of self-consciousness of the experimental conditions.

4. It was predicted that discrepancy scores (EABS minus SMI Posttest) would increase across groups, from little discrepancy in the control group, to greater discrepancy in the experimental groups, should OSA be induced. It was anticipated that there might be some difference between the magnitude of this discrepancy between the two experimental groups as a function of differential experimental conditions.

5. It was hypothesized that if OSA was induced, and if it continued beyond the experimental situation, the three groups would differ on the posttest-only measures of self-esteem, body esteem, and eating disorder proneness.

In addition, there were several correlational hypotheses:

1. Self-esteem (SAI scores) and body esteem (BES scores) would be positively correlated with each other.

2. Eating disorder proneness would be positively correlated with body size estimates (SMI pretest and posttest measures), estimated actual
body size (EABS), body size distortion ([DISTORT] changes from pretest to posttest) and body size discrepancy ([DISCREP] difference between self-estimates and the objective estimates of others).

3. It was further hypothesized that body size estimates (SMI pretest and posttest) would be positively correlated with estimated actual body size (EABS), body size distortion (DISTORT) and body size discrepancy (DISCREP).

4. Finally, it was predicted that self-esteem (SAI) and body esteem (BES) would be negatively correlated with eating disorder proneness (EDI), body size distortion (DISTORT) and body size discrepancy (DISCREP).
CHAPTER III

METHODS

Participants

The subjects in both study 1 and study 2 were undergraduate and graduate females from the accessible population at Utah State University (USU). With a student population of 13,000, 45 percent of the student body is female. USU is located in Logan and is a state land grant college. Logan is a city of approximately 35,000 in a relatively rural area of northeastern Utah. The population of the university and surrounding area is predominantly Caucasian.

Study 1

There were 27 subjects in the first study, ranging in age from 18 to 35, with a mean age of 22.9. Subjects were recruited from classes in the psychology department. Table 1 presents a summary of the sample demographics.

Study 2

There were 87 subjects in the second study, ranging in age from 18-34, with a mean age of 20.7. Subjects were recruited from numerous university classes. Table 2 describes the sample according to distribution by year in
school, marital status, and race.

Table 1.

**Distribution of Sample Demographics for Study 1**

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<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage</th>
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</tr>
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n=27

**Setting and Equipment**

Study 1 was conducted in the Community Clinic of the Department of Psychology at USU from June to August, 1988. The room used for the research was a counseling room containing lighting fixtures and seating. Study 2 was conducted at the USU Counseling Center from October 1989 to April 1990. Permission was obtained for the use of these facilities from the professional staff at the Counseling Center. Four different rooms were utilized. One of the
rooms was a counseling room with a desk and seating. Another room was a videotaping room containing seating, video camera, television monitor, and full-length mirror. The third room was a group room with seating and ample space for setting up the silhouette screen. The fourth room was a conference room with a table and chairs.

Distribution of Sample Demographics for Study 2

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<tr>
<td>All others</td>
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</tbody>
</table>

n=87

The silhouette apparatus consisted of a silhouette screen and background lighting. The silhouette screen was made of a white sheet attached to dowel sticks (one inch in diameter and four feet in length) at the top and bottom.
The bottom dowel served as a weight to make the sheet taut and steady. The screen was supported by two rack-like poles, one on each side. The background lighting was a portable overhead projector with a high-intensity lamp (500 watts, 120 volts). The silhouette screen was set up in the middle of the room, six feet from both the front and back walls. The projector was set up in the middle of the back wall on a small table (Appendix A).

Silhouette pictures were taken with a Polaroid 600 camera with flash in a room darkened except for the background lighting. The researcher stood in the middle of the front wall facing the sheet. Subjects were positioned behind the sheet prior to the researcher entering the room. Once the subject was directed to the appropriate place and stance, the photograph was taken. Subjects were asked to place their feet one foot apart and to allow their arms to swing out from their sides several inches. They were instructed to place their toes against the screen and lean into the screen slightly while the picture was taken. This procedure was similar to one used by Doughty, Moore, and Hartford (1974) to study somatotypes.

Procedures and Materials

Study 1

Upon arriving for the first session at the Community
Clinic, subjects were met by the researcher and her research assistant (an undergraduate female studying psychology at USU). The assistant reviewed the Research Consent Form (Appendix B) with each subject and provided an opportunity for the subject to ask questions prior to signing the consent. The subject was then escorted to the testing room and given instructions for completing the demographic information card (Appendix C), the Body Esteem Scale (BES), the Self-Attitude Inventory (SAI) and the Silhouette Measurement Instrument (SMI). Once instructions were given and any questions about the instructions answered, each subject was left alone in the room to complete the information. When the subject finished, she was scheduled for a second session in approximately one week.

When the subject came back for the second session, she was taken back to the test room to take the retest of the SMI. When this was completed, the researcher explained to each subject that she had been participating in a preliminary study intending to test some of the instruments and procedures that would be used in a second study, to be conducted in the future. The subject was given a chance to ask questions. The researcher thanked the subject for her participation and offered her a small coupon ($0.75) from a campus shop as a token of appreciation.
Study 2

When a subject arrived at the Counseling Center for the first session in study 2, she was met by the researcher and one of three female undergraduates serving as research assistants. The subject was taken to the room used for baseline and control conditions which contained only a desk and seating. The Research Consent Form/Revised (Appendix D) was reviewed and the subject was provided an opportunity to ask questions prior to signing the form. At that time, the subject also completed the Demographic Information Sheet (Appendix E). The subject was then given instructions (Appendix F) and left alone in the room to complete the Self-Consciousness Inventory/Revised (SCSR) and the Silhouette Measurement Instrument (SMI). At the end of this session (i.e., the baseline session), the subject was scheduled for the second session (i.e., the control or experimental retest session) approximately one to two weeks later. They were reminded to bring a bathing suit or body suit for the silhouette picture.

The second session began with the administration of the two dependent measures (SMI; SCSR) under one of three experimental conditions, to which subjects were randomly assigned, with 29 subjects per group. The three groups were as follows:

Control: Subjects were seated in a room with none of the experimental conditions present, as in the first
session.

VCR/Mirror: A large mirror was positioned directly in front of where the subject was seated. A video camera was also placed in the room, with the monitor positioned in front of the subject and displaying the subject's image. Subjects were asked not to touch any of the equipment in the room, and to be aware of the visual feedback while she rated herself.

Observer/Rater: A confederate observer was seated in the room, in front of the subject, for the alleged purpose of rating the subject on the silhouette chart and recording physical and behavioral descriptions while the subject rated herself.

Following the experimental session, subjects were taken to the conference room for completing the posttest-only assessments of self-esteem, body esteem, and eating-disorder proneness. They were then taken to the group room for the silhouette photograph and debriefing. Subjects posed for an anonymous silhouette photograph (identified by subject number only), in which they stood behind the silhouette screen in either a bathing suit, body suit, or their underwear, whichever they preferred, while the researcher gave instructions for position and took the photograph. (See section on setting and equipment.) Following this session, they were debriefed and offered a small coupon ($.75) from a campus shop as a token of appreciation.
silhouettes on the SMI. Two independent judges rated each photograph and assigned it a number based on its similarity to one of the silhouettes on the SMI. Interrater reliability was within acceptable limits \((r=.82)\). This yielded a score (Estimated Actual Body Size [EABS]) that was used to determine a discrepancy score for each subject between their estimation and the EABS, for both baseline and experimental conditions. An average of the judges ratings was used when they were not in agreement.

After the study was completed, participants were informed that if their participation in the research raised any personal concerns, they could contact the experimenter to discuss those concerns. They were also told that they would be receiving a summary of the results of the study when the study and analysis of the data had been completed.

**Instruments**

Each subject was asked to fill out the Self-Attitude Inventory (Appendix G), Body Esteem Scale (Appendix H), Eating Disorder Inventory (Appendix I), Silhouette Measurement Instrument (Appendix J), Self-Consciousness Scale/Revised (Appendix K), and Demographic Information Sheet.
Self-Attitude Inventory

The Self-Attitude Inventory (SAI) was developed by Lorr and Wunderlich (1986) to measure two hypothesized facets of self-esteem: "self-confidence" and "popularity." The self-confidence scale includes items that tap expectations for succeeding in competitive situations, feelings of achievement and pride in self, and self-security. The popularity scale assesses the extent to which a person feels socially accepted, included, and liked by important others.

The reported correlation between the two scales is .42. Alpha estimates of reliability were found to be .80 for Confidence and .69 for Popularity. Comparison of the two scales to Rosenberg's Self-Esteem Scale (1965) yielded correlations of .69 and .35, respectively. In two other samples, coefficient alphas for Confidence reached .86 and .85, while Popularity coefficient alphas reached .78 and .81. The first of these two samples had a total of 189 junior high males, while the second sample used a total of 521 high school males. Some evidence for concurrent validity appears to have been established. The SAI consists of 32 forced-choice items related to the construct of self-esteem, as described above. Means and standard deviations are provided.

Body Esteem Scale

The Body Esteem Scale (BES), developed by Franzoi and
Shields (1984), measures factors of body esteem for both males and females. There are three factors associated with body esteem for each sex, although these differ slightly between the sexes. For males, the factors include Physical Attractiveness, Upper Body Strength, and Physical Condition. For females, the factors include Sexual Attractiveness, Weight Concern, and Physical Condition. Physical Attractiveness has to do with men's ideas about their own facial features and overall physical appeal. Upper Body Strength relates to men's feelings of physical prowess and energy. Physical Condition refers to adroitness, overall strength, and stamina in both sexes. Sexual Attractiveness has to do with women's feelings about various sexual parts of their bodies as well as their facial features. Weight Concern refers to body parts and functions that are seen by women as relating to control of food intake. Test items are responded to on a 5-point scale, where 1=strong negative feelings, 2=moderate negative feelings, 3=no feelings one way or the other, 4=moderate positive feelings, and 5=strong positive feelings.

Franzoi and Shields (1984) reported significant positive correlations between the BES and general self-esteem measures. They found that BES subscales, when used as predictor variables for self-esteem, accounted for 17.63% and 21.63% of the variance in males and females, respectively. Alpha coefficients for males were found to be
.81 (physical attractiveness), .85 (upper body strength), and .86 (physical condition). Alpha coefficients for females were found to be .78 (sexual attractiveness), .87 (weight concern), and .82 (physical condition). Moderate correlations regarding convergent validity were obtained (except for weight concern for females) with the Rosenberg Self-Esteem Scale (1965). Evidence for discriminant validity was also reported.

Eating Disorder Inventory

Garner, Olmstead, and Polivy (1983) developed the Eating Disorder Inventory (EDI) as a multidimensional assessment tool regarding the psychological traits of individuals with anorexia nervosa and bulimia. They were responding to a need for a more accurate measure of traits distinguishing various subgroupings of eating disorders. The EDI is a 64-item scale, with 8 subscales, including Drive for Thinness (preoccupation with weight and weight matters), Bulimia (episodic binging and purging experienced as out-of-control), Body Dissatisfaction (parts of the body are seen as being "too large"), Ineffectiveness (feelings of insecurity, inadequacy, low worth, etc.), Perfectionism (unrealistically high self-expectations, driven to be the best), Interpersonal Distract (feelings of alienation, fear of intimacy), Interoceptive Awareness (feelings of inability to distinguish emotions and gastric sensations), and
Maturity Fears (desire to remain secure in the behaviors of the past, fears regarding the demands of growing up).

Scale items are responded to on a 6-point forced-choice scale: always, usually, often, sometimes, rarely, or never, with the most extreme eating disorder responses being scored as 3 (always or never, depending on item direction), the next most disordered responses being scored as 2, the third most disordered responses being scored as 1, and the three least disordered responses receiving a score of 0.

Average item-total correlation is .63 (SD=0.13). Reliability coefficients for the anorexic group range from .82 to .90 on individual subscales. In a discriminant function analysis, correct classifications by individual scales range from 87.6% (Bulimia) to 93.1% (Perfectionism). Correct classification based on all subscales combined is 91.7%. The authors reported minimal response set bias. They also reported good criterion-related validity, both with comparison samples and with clinical experts.

Silhouette Measurement Instrument

The Silhouette Measurement Instrument (SMI) was developed by Bell, Kirkpatrick, and Rinn (1986) as an alternative way of measuring differences in body image perception among anorexic, obese, and control subjects. The SMI is comprised of eight silhouette figures of a female
body, ranging from very emaciated to very obese. The figures are meant to be arranged randomly on the chart, which requires subjects to view all the figures before answering. Scores range from one to eight (1 = smallest figure; 8 = largest figure). Using the SMI, the authors found that anorexic subjects significantly overestimated their body shape, while obese subjects tended to underestimate their appearance, and control subjects tended to place themselves relatively accurately. The chart was subsequently used effectively by the authors as a measure of treatment progress as well as an indicator of the presence of an eating disorder. A partial case for concurrent validity was made in the present research (Study 1), on the basis of moderate negative correlations between SMI scores and Weight Concern on the Body Esteem Scale (r = -0.51, p < .01).

Self-Consciousness Scale

The Self-Consciousness Scale (SCS) was designed by Fenigstein, Scheier, and Buss (1975) to improve upon existing measures of body consciousness, such as those developed by Secord and Jourard (1953) and Fisher (1964), by separating out private and public aspects of body consciousness, inspired by the work of Argyle (1969) and Diaval and Wicklund (1972) on the effects of differing states of self-awareness. The scale essentially measures individual differences in self-consciousness on three
dimensions: Public Self-Consciousness, Private Self-Consciousness, and Social Anxiety. This measure has been widely used to assess the construct of objective self-awareness (e.g., Brockner & Wallnau, 1981; Carver & Scheier, 1978; Plant & Ryan, 1985).

The SCS was revised by Scheier and Carver (1985) because they found that many subjects had difficulty understanding the items as they were worded. The wording was changed to be more easily understood by a general population, although the content remain essentially the same. The revised version was highly correlated with the original (all in the low to mid .80s). Test-retest reliability correlations were: .76 (Private Self-Consciousness), .74 (Public Self-Consciousness), and .77 (Social Anxiety). Cronbach alphas were computed with the following results: .84 (Public Self-Consciousness), .75 (Private Self-Consciousness), and .79 (Social Anxiety).

The SCS/R consists of 22 items, each of which is rated on a scale from 0 ("not at all like me") to 3 ("a lot like me"). Nine items pertain to Private Self-Consciousness (e.g., "I'm always trying to figure myself out"); seven pertain to Public Self-Consciousness (e.g., "I'm concerned about the way I present myself")' and six pertain to Social Anxiety (e.g., "It takes me time to overcome my shyness in new situations").
Demographic Information Sheet

The Demographic Information Sheet is a brief form designed by the researcher and asks subjects to give their age, year in school, ethnicity, marital status, and date of initial session.
CHAPTER IV

RESULTS

Study 1

A preliminary study was completed to provide initial evidence of test-retest reliability on the major dependent measure (SMI) in this investigation in order to determine the coefficient of stability (Borg & Gall, 1983). This type of reliability was used because it was not possible to conduct split-half or alternate forms reliability checks. The SMI involves only one response to one set of 8 discrete choices.

The prime objective was to demonstrate the stability of the SMI in assessing body size estimations. The secondary objective was to establish some preliminary data with respect to a female college population on two of the measures to be utilized in the main study (BES & SAI).

As expected, the test-retest correlation coefficient was high (r=.91, p<.0001). Paired t-tests were conducted on the two administrations of the SMI. Results on the test-retest reliability of the SMI demonstrated no significant difference (t= -1.69; p= .10) between the two administrations. Table 3 summarizes these results.
Table 3.

T-test Values on Means of SMI Pre-Post Administrations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMI-Pre</td>
<td>3.78</td>
<td>1.12</td>
<td>-1.69</td>
<td>NS</td>
</tr>
<tr>
<td>SMI-Post</td>
<td>3.93</td>
<td>1.04</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<.05  
n=27

A reliability analysis was run on the two additional measures being investigated (BES & SAI), as well as the subscales for each of the instruments. Reliability alpha coefficients for the BES were as follows: BES total= .87, Sexual Attractiveness (SA) subscale= .72, Weight Concern (WC) subscale= .88, and Physical Condition (PC) subscale= .83. Coefficient alpha reliabilities for the SAI were as follows: SAI total=.88, Popularity (POP) subscale=.83, and Confidence (CONF) subscale=.82. Descriptive statistics for the BES and SAI are outlined in Tables 4 and 5 and compared with means on samples reported in the literature (Franzoi & Herzog, 1986; Lorr & Wunderlich, 1986).
Table 4.

Study 1: Descriptive Statistics on the BES for the Present Research and Previous Research with Females (Franzoi & Herzog, 1986)

<table>
<thead>
<tr>
<th>Present Research</th>
<th>Previous Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>Mean</td>
</tr>
<tr>
<td>Sexual Attractiveness</td>
<td>46.59</td>
</tr>
<tr>
<td>Weight Concern</td>
<td>26.11</td>
</tr>
<tr>
<td>Physical Condition</td>
<td>28.59</td>
</tr>
<tr>
<td>BES Total</td>
<td>101.30</td>
</tr>
</tbody>
</table>

n=27

Table 5.

Study 1: Descriptive Statistics on the SAI for the Present Research and Previous Research (Lorr & Wunderlich, 1986)

<table>
<thead>
<tr>
<th>Present Research</th>
<th>Previous Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>Mean</td>
</tr>
<tr>
<td>Confidence</td>
<td>11.78</td>
</tr>
<tr>
<td>Popularity</td>
<td>12.04</td>
</tr>
<tr>
<td>SAI Total</td>
<td>23.82</td>
</tr>
</tbody>
</table>

n=27
Study 2

Inducing Objective Self-Awareness

In the present study, the first experimental hypothesis predicted that the conditions of VCR/Mirror and Observer/Rater would induce a state of heightened OSA. In actuality, this was a test of the null hypothesis that the conditions found in research on body image in eating disorders would not induce heightened self-consciousness (OSA). First, to assess whether or not the procedures produced within-group changes in OSA, three separate paired t-tests were computed for the control and each of the two experimental groups. This analysis compared pretest scores to posttest scores by group on the OSA measure (SCSR) and its subscales: Private Self-Consciousness (Private SC), Public Self-Consciousness (Public SC) and Social Anxiety (Anxiety). Evidence for the experimental effect would require that the two experimental groups (VCR/Mirror and Observer/Rater) be associated with a significant increase from pretest to posttest, while the control group would show no significant change on the same instrument.

The results of the paired t-tests indicated a statistically significant difference on the Public Self-Consciousness scale for the control group (t = -2.34, one-tailed p = .027). That increase was, however, actually less than one standard error of measurement, and thus was not
considered an important finding from a practical standpoint. Also, since it occurred in the control group, it would not have supported the OSA hypothesis at any rate. No other significant differences in the control group were found. Table 6 summarizes the t-test findings for the control group.

Table 6.

Paired T-test Results for Control Group Differences on SCSR Pretest and Posttest

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre</th>
<th>SD</th>
<th>Post</th>
<th>SD</th>
<th>t</th>
<th>prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Self-Consciousness</td>
<td>1.85</td>
<td>.35</td>
<td>1.92</td>
<td>.48</td>
<td>-1.14</td>
<td>NS</td>
</tr>
<tr>
<td>Public Self-Consciousness</td>
<td>2.14</td>
<td>.66</td>
<td>2.25</td>
<td>.65</td>
<td>-2.34</td>
<td>.027</td>
</tr>
<tr>
<td>Social Anxiety</td>
<td>1.33</td>
<td>.74</td>
<td>1.34</td>
<td>.75</td>
<td>.17</td>
<td>NS</td>
</tr>
<tr>
<td>Total Self-Consciousness</td>
<td>39.33</td>
<td>8.30</td>
<td>41.10</td>
<td>10.06</td>
<td>-1.70</td>
<td>NS</td>
</tr>
</tbody>
</table>

*p<.05  
n=29

T-test results for Groups B and C are represented in Tables 7 and 8, respectively. Although no significant differences between pretest and posttest scores were observed for either experimental group, Public Self-Consciousness rose in the audience group to a level approaching significance (t=-1.66, one-tailed p=.06).
Table 7.
Paired T-Test Results for VCR/Mirror Group Differences on SCSR Pretest and Posttest

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre Mean</th>
<th>SD</th>
<th>Post Mean</th>
<th>SD</th>
<th>t</th>
<th>prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Self-Consciousness</td>
<td>2.12</td>
<td>.38</td>
<td>2.08</td>
<td>.41</td>
<td>.86</td>
<td>NS</td>
</tr>
<tr>
<td>Public Self-Consciousness</td>
<td>2.23</td>
<td>.44</td>
<td>2.23</td>
<td>.45</td>
<td>.14</td>
<td>NS</td>
</tr>
<tr>
<td>Social Anxiety</td>
<td>1.75</td>
<td>.59</td>
<td>1.80</td>
<td>.55</td>
<td>-1.12</td>
<td>NS</td>
</tr>
<tr>
<td>Total Self-Consciousness</td>
<td>45.24</td>
<td>5.82</td>
<td>45.10</td>
<td>6.28</td>
<td>-1.44</td>
<td>NS</td>
</tr>
</tbody>
</table>

*p<.05
n=29

Table 8.
Paired T-test Results for Observer/Rater Group Differences on SCSR Pretest and Posttest

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre Mean</th>
<th>SD</th>
<th>Post Mean</th>
<th>SD</th>
<th>t</th>
<th>prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Self-Consciousness</td>
<td>1.92</td>
<td>.46</td>
<td>1.89</td>
<td>.47</td>
<td>.83</td>
<td>NS</td>
</tr>
<tr>
<td>Public Self-Consciousness</td>
<td>2.31</td>
<td>.53</td>
<td>2.39</td>
<td>.53</td>
<td>-1.66</td>
<td>NS</td>
</tr>
<tr>
<td>Social Anxiety</td>
<td>1.53</td>
<td>.76</td>
<td>1.48</td>
<td>.73</td>
<td>.98</td>
<td>NS</td>
</tr>
<tr>
<td>Total Self-Consciousness</td>
<td>42.59</td>
<td>9.28</td>
<td>42.59</td>
<td>9.30</td>
<td>.00</td>
<td>NS</td>
</tr>
</tbody>
</table>

*p<.05
n=29
Next, an analysis of covariance was performed on the SCSR posttest scores, with pretest scores as covariates, in order to determine whether there were between-group differences in OSA as a result of differential experimental treatment. Since this type of analysis makes subjects equivalent on the pretest (assumes no between-group pretest differences), significant changes on the posttest are generally indicative of experimental effect. No significant difference between groups was found for any of the pretest-posttest measures (Total Self-Consciousness: $F(2,83)=1.01$, ns; Private Self-Consciousness: $F(2,83)=1.08$, ns; Public Self-Consciousness: $F(2,83)=1.50$, ns; Social Anxiety: $F(2,83)=1.75$, ns). Social Anxiety differences approached significance, as did Public Self-Consciousness. Table 9 presents a summary of these findings.

Although there were no meaningfully significant group differences in OSA as measured by the SCSR, Pearson correlation coefficients were computed for all of the measures, in order to more fully examine relationships between the variables in the study. There were several significant correlations, some of which will be introduced at this time due to their relevance to the self-consciousness component of the research.
Table 9.

Analysis of Covariance for Posttest Differences on the Self-Consciousness Scale (R) and its Subscales

<table>
<thead>
<tr>
<th>Variable</th>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>f</th>
<th>prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Self-Consciousness</td>
<td>Group</td>
<td>2</td>
<td>6.45</td>
<td>1.05</td>
<td>.35</td>
</tr>
<tr>
<td></td>
<td>Pretest</td>
<td>1</td>
<td>902.74</td>
<td>147.31</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>83</td>
<td>6.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Self-Consciousness</td>
<td>Group</td>
<td>1</td>
<td>4.83</td>
<td>1.79</td>
<td>.17</td>
</tr>
<tr>
<td></td>
<td>Pretest</td>
<td>1</td>
<td>1027.53</td>
<td>380.52</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>83</td>
<td>2.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Anxiety</td>
<td>Group</td>
<td>2</td>
<td>4.45</td>
<td>1.44</td>
<td>.24</td>
</tr>
<tr>
<td></td>
<td>Pretest</td>
<td>1</td>
<td>1154.09</td>
<td>373.50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>83</td>
<td>3.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Self-Consciousness</td>
<td>Group</td>
<td>2</td>
<td>18.93</td>
<td>1.26</td>
<td>.29</td>
</tr>
<tr>
<td></td>
<td>Pretest</td>
<td>1</td>
<td>5115.34</td>
<td>341.55</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>83</td>
<td>14.98</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<.05
n=87

First, it was observed that pretest and posttest Self-Consciousness Totals (SCSR) were negatively correlated with the Self-Esteem Total ([SAI] pretest: r= -.58, posttest: r= -.55; p<.001) and the Body Esteem Total ([BES] pretest: r= -.40, posttest: r= -.35; p<.001). Although the correlations are modest, this suggests that self-consciousness is at
least partially explained by decreased self-esteem and body esteem. Table 10 summarizes the findings for these three measures and their subscales.

Table 10.

Pearson Correlations for SCSR Pre and Post Measures with SAI and BES

<table>
<thead>
<tr>
<th>SCSR Total</th>
<th>Private SC</th>
<th>Public SC</th>
<th>Soc Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>SAI Total</td>
<td>-.58*</td>
<td>-.55*</td>
<td>-.19*</td>
</tr>
<tr>
<td>Confidence</td>
<td>-.51*</td>
<td>-.50*</td>
<td>-.10</td>
</tr>
<tr>
<td>Popularity</td>
<td>-.51*</td>
<td>-.46*</td>
<td>-.23*</td>
</tr>
<tr>
<td>BES Total</td>
<td>-.40*</td>
<td>-.35*</td>
<td>-.22*</td>
</tr>
<tr>
<td>Sexual</td>
<td>-.27*</td>
<td>-.28*</td>
<td>-.18*</td>
</tr>
<tr>
<td>Attractiveness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight Concern</td>
<td>-.31*</td>
<td>-.28*</td>
<td>-.08</td>
</tr>
<tr>
<td>Physical Condition</td>
<td>-.39*</td>
<td>-.30*</td>
<td>-.31*</td>
</tr>
</tbody>
</table>

*p<.05
n=87

Another finding was that Self-Consciousness was positively correlated with Eating Disorder proneness (EDI) (r = .55 and .53, p < .001, for SCSR pretest and posttest respectively), as well as with several of its subscales. Summaries of the above findings are presented in Table 11.
Table 11.
Pearson Correlations for SCSR Pre and Post Measures with EDI

<table>
<thead>
<tr>
<th></th>
<th>SCSR Total</th>
<th>Private SC</th>
<th>Public SC</th>
<th>Soc Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>EDI Total</td>
<td>.55*</td>
<td>.53*</td>
<td>.19*</td>
<td>.16</td>
</tr>
<tr>
<td>Drive for Thinness</td>
<td>.42*</td>
<td>.41*</td>
<td>.03</td>
<td>.06</td>
</tr>
<tr>
<td>Bulimia</td>
<td>.41*</td>
<td>.35*</td>
<td>.17</td>
<td>.10</td>
</tr>
<tr>
<td>Body Dissatisfaction</td>
<td>.33*</td>
<td>.31*</td>
<td>-.02</td>
<td>-.07</td>
</tr>
<tr>
<td>Ineffectiveness</td>
<td>.53*</td>
<td>.52*</td>
<td>.35*</td>
<td>.35*</td>
</tr>
<tr>
<td>Perfectionism</td>
<td>.24*</td>
<td>.22*</td>
<td>.23*</td>
<td>.20*</td>
</tr>
<tr>
<td>Interpersonal Distrust</td>
<td>.38*</td>
<td>.41*</td>
<td>.06</td>
<td>.07</td>
</tr>
<tr>
<td>Interoceptive Awareness</td>
<td>.52*</td>
<td>.50*</td>
<td>.28*</td>
<td>.26*</td>
</tr>
<tr>
<td>Maturity Fears</td>
<td>.26*</td>
<td>.26*</td>
<td>.21*</td>
<td>.20*</td>
</tr>
</tbody>
</table>

*p<.05
n=87

Finally, the Private Self-Consciousness subscale of the SCSR was observed to negatively correlate with the Discrepancy Index ([DISCREP], pretest: r= -.21, posttest: r= -.24; p<.05), while the Public Self-Consciousness subscale was positively correlated with the Discrepancy Index (pretest: r=.33, posttest: r= .30; p<.01). This suggests an important distinction between public and private self-
consciousness, particularly in terms of the discrepancy between how one sees oneself versus how one is seen by objective others. The results of this set of comparisons are presented in Table 12, along with non-significant findings on the Silhouette Measure (SMI), the Distortion Index (DISTORT), and the Estimated Actual Body Size (EABS) Score. Again, although non-significant, there was a relationship approaching significance between Public Self-Consciousness and body size estimates for both pretest and posttest data (p<.10).

Table 12.

Pearson Correlations for SCSR Pre and Post Measures with SMI Pre and Post, DISTORT, DISCREP, and EABS

<table>
<thead>
<tr>
<th></th>
<th>SCSR Total Pre</th>
<th>SCSR Total Post</th>
<th>Private SC Pre</th>
<th>Private SC Post</th>
<th>Public SC Pre</th>
<th>Public SC Post</th>
<th>Soc Anxiety Pre</th>
<th>Soc Anxiety Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMI-Pre</td>
<td>.10</td>
<td>.04</td>
<td>-.02</td>
<td>-.09</td>
<td>.14</td>
<td>.14</td>
<td>.08</td>
<td>.04</td>
</tr>
<tr>
<td>SMI-Post</td>
<td>.14</td>
<td>.07</td>
<td>-.02</td>
<td>-.08</td>
<td>.17</td>
<td>.16</td>
<td>.13</td>
<td>.09</td>
</tr>
<tr>
<td>DISTORT</td>
<td>.12</td>
<td>.09</td>
<td>.01</td>
<td>.03</td>
<td>.08</td>
<td>.02</td>
<td>.14</td>
<td>.14</td>
</tr>
<tr>
<td>DISCREP</td>
<td>.14</td>
<td>.09</td>
<td>-.21*</td>
<td>-.24*</td>
<td>.33*</td>
<td>.30*</td>
<td>.15</td>
<td>.14</td>
</tr>
<tr>
<td>EABS</td>
<td>-.00</td>
<td>-.02</td>
<td>.12</td>
<td>.08</td>
<td>-.09</td>
<td>-.07</td>
<td>-.02</td>
<td>-.06</td>
</tr>
</tbody>
</table>

*p<.05
n=87
The results indicate that the camera, mirror, and observer/rater techniques used in the literature to measure body size estimates did not induce significantly higher objective self-awareness in this study. These findings suggest that the use of cameras and mirrors (as in the VCR/Mirror group of the present study) and objective raters (as in the Observer/Rater group of the present study) probably does not induce increased self-consciousness or changes in body estimates among nonclinical groups. This may not be generalizeable to clinical populations, especially eating-disordered groups. Further experimental analyses were performed to test the OSA-related hypotheses for the sake of inquiry and to illuminate possible explanations for the absence of significant increases in self-consciousness under conditions that, at least in the self-awareness literature, have led to reports of increased self-consciousness.

Pretest Differences

Although random assignment of subjects to the three research groups was utilized, potential pretest differences between groups were assessed by a series of one-way analyses of variances. Tables 13 and 14 summarize these analyses. The VCR/Mirror group was found to be significantly different on the pretest from the other groups on the Private Self-Consciousness subscale of the SCSR (2, 84; MS=46.39, p=.03) as well as on the overall SCSR (2,84; MS=226.43, p=.03).
This finding could have had some impact on posttest differences, had there been any. If the VCR/Mirror group had produced significant posttest differences on the Private and overall Self-Consciousness scales, the pretest findings would have been important. However, because there were no significant posttest differences even with the two pretest differences, it is unlikely that the significance translated

Table 13.
One-Way Analysis of Variance Tables on Pretest Differences Between Groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Source</th>
<th>df</th>
<th>M-Squares</th>
<th>prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private SC</td>
<td>Between</td>
<td>2</td>
<td>46.39</td>
<td>.03</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>84</td>
<td>13.00</td>
<td></td>
</tr>
<tr>
<td>Public SC</td>
<td>Between</td>
<td>2</td>
<td>9.98</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>84</td>
<td>14.65</td>
<td></td>
</tr>
<tr>
<td>Social Anxiety</td>
<td>Between</td>
<td>2</td>
<td>47.25</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>84</td>
<td>17.58</td>
<td></td>
</tr>
<tr>
<td>SCSR Total</td>
<td>Between</td>
<td>2</td>
<td>226.43</td>
<td>.03</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>84</td>
<td>63.03</td>
<td></td>
</tr>
<tr>
<td>SMI</td>
<td>Between</td>
<td>2</td>
<td>.77</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>84</td>
<td>1.78</td>
<td></td>
</tr>
</tbody>
</table>

*p<.05  
n=87
to any treatment differences. Also, because the difference between the two means was less than one standard error of measurement, the impact of the significance is questionable.

Table 14.

Group Means for Scales on Which Pretest Differences Exist
(Ranges for the 0.05 Level)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Self-Consciousness</td>
<td>Control</td>
<td>16.69</td>
</tr>
<tr>
<td></td>
<td>VCR/Mirror</td>
<td>19.10*</td>
</tr>
<tr>
<td></td>
<td>Observer/Rater</td>
<td>17.24</td>
</tr>
<tr>
<td>SCSR Total</td>
<td>Control</td>
<td>7.97</td>
</tr>
<tr>
<td></td>
<td>VCR/Mirror</td>
<td>10.52*</td>
</tr>
<tr>
<td></td>
<td>Observer/Rater</td>
<td>9.17</td>
</tr>
</tbody>
</table>

*p<.05
n=87

Body Size Perception

Another basic hypothesis of this investigation was that, if induced, OSA would influence body size perceptions (changes or differences in rating of body size). To test this hypothesis, three measures of body size estimation were used in three independent analyses of variance. First, the SMI posttest measure was included in an analyses of covariance using pretest scores as covariates. The results of this analysis are presented in Table 15. No significant group effects were observed (f=.72, p=.49).
Table 15.
Results of the Analysis of Covariance on the SMI Posttest

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>M Squares</th>
<th>F</th>
<th>prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>2</td>
<td>.15</td>
<td>.72</td>
<td>NS</td>
</tr>
<tr>
<td>SMIA (Covar)</td>
<td>1</td>
<td>133.95</td>
<td>627.75</td>
<td>.00</td>
</tr>
<tr>
<td>Residual</td>
<td>83</td>
<td>.21</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<.05  
n=87

Next, a distortion index (DISTORT) was derived for each subject by subtracting the pretest score from the posttest score on the SMI. This distortion index represented the amount and direction of change in body size estimation from pretest to posttest. This score was used as a dependent variable in a one-way analysis of variance, the results of which are presented in Table 16. Again, no significant group effects were observed (2,84; F=.69, p=.50).

Table 16.
One-Way Analysis of Variance on the Body Size Distortion Index (DISTORT) from Pretest to Posttest

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>M Squares</th>
<th>F</th>
<th>prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>.15</td>
<td>.69</td>
<td>NS</td>
</tr>
<tr>
<td>Residual</td>
<td>84</td>
<td>.22</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<.05  
n=87
Finally, the EABS score was used to calculate a discrepancy index (DISCREP). The SMIB (posttest) score was subtracted from the EABS score to derive the discrepancy index, which was then entered as a dependent variable in a third analysis of variance. The findings, which are consistent with the other two analyses, are summarized in Table 17. No significant group differences were observed ($f=.23$, $p=.79$). In a non-parametric analysis of the discrepancy index (Wilcoxon Matched-Pairs Signed Ranks test), it was observed that a significant number of rank differences existed ($z=-2.39$, 2-tailed $p=.02$) such that there were 23 self-rankings which were less than the EABS, 24 self-rankings that were equal to the EABS, and 40 self-rankings that were greater than the EABS.

Table 17.

One-Way Analysis of Variance on the Body Size Discrepancy Index (DISCREP) from Pretest to Posttest

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>M Squares</th>
<th>F</th>
<th>prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>.22</td>
<td>.23</td>
<td>NS</td>
</tr>
<tr>
<td>Residual</td>
<td>84</td>
<td>.93</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<.05
n=87
The last experimental hypothesis was that the three groups would differ on the posttest-only assessments of eating disorders proneness (EDI), self-esteem (SAI) and body esteem (BES), as a result of the tests being administered after the experimental sessions where OSA would hypothetically be induced. The means for the three tests were compared by group using a series of one-way analyses of variance. Results indicated non-significance between groups on all three measures (p>.10), despite a gain of 11 points from the control group to the audience group on the Eating Disorder Inventory. Tables 18, 19, and 20 provide descriptive statistics and mean comparisons for these measures.

Table 18.
Descriptive Statistics on the BES and SAI by Group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control</th>
<th>VCR/Mirror</th>
<th>Observer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>BES Total</td>
<td>104.10</td>
<td>17.5</td>
<td>101.97</td>
</tr>
<tr>
<td>Sexual Attract</td>
<td>45.14</td>
<td>6.5</td>
<td>45.24</td>
</tr>
<tr>
<td>Weight Control</td>
<td>27.10</td>
<td>9.6</td>
<td>26.79</td>
</tr>
<tr>
<td>Physical Condition</td>
<td>31.86</td>
<td>6.0</td>
<td>29.93</td>
</tr>
<tr>
<td>SAI Total</td>
<td>25.17</td>
<td>5.9</td>
<td>23.90</td>
</tr>
<tr>
<td>Confidence</td>
<td>11.90</td>
<td>3.3</td>
<td>11.72</td>
</tr>
<tr>
<td>Popularity</td>
<td>13.28</td>
<td>3.1</td>
<td>12.17</td>
</tr>
</tbody>
</table>
Table 19.
Descriptive Statistics on the EDI by Group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control</th>
<th></th>
<th>VCR/Mirror</th>
<th></th>
<th>Observer</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>EDI Total</td>
<td>36.38</td>
<td>20.3</td>
<td>39.93</td>
<td>25.8</td>
<td>47.59</td>
<td>33.0</td>
</tr>
<tr>
<td>Drive for Thinness</td>
<td>5.83</td>
<td>6.2</td>
<td>7.00</td>
<td>6.8</td>
<td>8.52</td>
<td>6.9</td>
</tr>
<tr>
<td>Bulimia</td>
<td>1.45</td>
<td>2.1</td>
<td>3.24</td>
<td>4.2</td>
<td>3.31</td>
<td>4.6</td>
</tr>
<tr>
<td>Body Dissatisfaction</td>
<td>12.52</td>
<td>9.3</td>
<td>11.31</td>
<td>8.9</td>
<td>13.93</td>
<td>9.4</td>
</tr>
<tr>
<td>Ineffectiveness</td>
<td>2.03</td>
<td>2.9</td>
<td>2.55</td>
<td>3.3</td>
<td>3.76</td>
<td>5.6</td>
</tr>
<tr>
<td>Perfectionism</td>
<td>6.66</td>
<td>4.1</td>
<td>7.31</td>
<td>3.7</td>
<td>8.35</td>
<td>4.6</td>
</tr>
<tr>
<td>Interpersonal Distrust</td>
<td>2.35</td>
<td>2.7</td>
<td>2.45</td>
<td>2.6</td>
<td>2.76</td>
<td>3.2</td>
</tr>
<tr>
<td>Interoceptive Awareness</td>
<td>3.59</td>
<td>3.0</td>
<td>4.03</td>
<td>4.6</td>
<td>4.76</td>
<td>6.4</td>
</tr>
<tr>
<td>Maturity Fears</td>
<td>1.97</td>
<td>2.3</td>
<td>2.03</td>
<td>2.7</td>
<td>2.21</td>
<td>2.6</td>
</tr>
</tbody>
</table>

n=87

Within-group analyses of body size perception comparing pretest to posttest scores by group (t-tests) and between-group comparisons using posttest scores (analyses of covariance) consistently resulted in no significant differences. Since OSA effects as measured by the SCSR were not established for either experimental group, thus supporting the null hypothesis, it was impossible to adequately assess what the effects of OSA on body size
estimation might have been. Therefore, hypotheses 2, 3, 4, and 5 could not be successfully answered.

Table 20.

Between-Group Mean Comparisons for the EDI, SAI, and BES

<table>
<thead>
<tr>
<th>Variable</th>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDI</td>
<td>Between</td>
<td>2</td>
<td>951.25</td>
<td>1.32</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>84</td>
<td>722.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAI</td>
<td>Between</td>
<td>2</td>
<td>12.29</td>
<td>.35</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>84</td>
<td>35.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BES</td>
<td>Between</td>
<td>2</td>
<td>116.18</td>
<td>.31</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>84</td>
<td>377.36</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*P<.05
n=87

Correlational Hypotheses

Several correlational hypotheses were developed as a way of further exploring the relationships between self-esteem, body esteem, body image disturbance, and eating disorder proneness. These constructs have been associated in the general literature of self-perception (including body image and objective self awareness research) as well as in some eating disorder research. Pearson correlation coefficients were calculated on all scales and subscales in a correlation matrix.

The first of these hypotheses was that there would be a positive correlation between self-esteem (SAI scores) and
body esteem (BES scores). This correlation would indicate some continuity between various aspects of overall self-image. As expected, there was a positive correlation ($r=.38, p<.001$) between SAI and BES totals. The overall relationships between SAI and BES totals and subscales are summarized in Table 21.

Table 21.

Pearson Correlations for SAI with BES

<table>
<thead>
<tr>
<th></th>
<th>SAI Total</th>
<th>Confidence</th>
<th>Popularity</th>
</tr>
</thead>
<tbody>
<tr>
<td>BES Total</td>
<td>.38*</td>
<td>.48*</td>
<td>.17</td>
</tr>
<tr>
<td>Sexual Attractiveness</td>
<td>.30*</td>
<td>.42*</td>
<td>.10</td>
</tr>
<tr>
<td>Weight Concern</td>
<td>.33*</td>
<td>.45*</td>
<td>.12</td>
</tr>
<tr>
<td>Physical Condition</td>
<td>.29*</td>
<td>.30*</td>
<td>.20</td>
</tr>
</tbody>
</table>

*p<.01  
n=87

The second correlational hypothesis was that there would be positive correlations of eating disorder proneness (EDI) with SMI pretest (A) and posttest (B) scores, Estimated Actual Body Size (EABS), distortion index (DISTORT) and discrepancy index (DISCREP). A complete summary of these correlations is provided in Table 22. The overall EDI was positively correlated with SMI Pre and Post ($r=.56$ and $.58$ respectively, $p<.001$), EABS ($r=.32$, $p<.01$),
and DISCREP (r=.30, p<.01), but not with DISTORT (p=.25).

Table 22.

Pearson Correlation for SMI Pre and Post, EABS, DISTORT, and DISCREP with EDI

<table>
<thead>
<tr>
<th></th>
<th>SMI PRE</th>
<th>SMI POST</th>
<th>EABS</th>
<th>DISTORT</th>
<th>DISCREP</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDI Total</td>
<td>.56*</td>
<td>.58*</td>
<td>.32*</td>
<td>.07</td>
<td>.30*</td>
</tr>
<tr>
<td>Drive for Thinness</td>
<td>.50*</td>
<td>.51*</td>
<td>.21*</td>
<td>.04</td>
<td>.38*</td>
</tr>
<tr>
<td>Bulimia</td>
<td>.38*</td>
<td>.39*</td>
<td>.30*</td>
<td>.03</td>
<td>.09</td>
</tr>
<tr>
<td>Body Dissatisfaction</td>
<td>.67*</td>
<td>.66*</td>
<td>.42*</td>
<td>-.01</td>
<td>.30*</td>
</tr>
<tr>
<td>Ineffectiveness</td>
<td>.39*</td>
<td>.40*</td>
<td>.27*</td>
<td>.05</td>
<td>.15</td>
</tr>
<tr>
<td>Perfectionism</td>
<td>.12</td>
<td>.19*</td>
<td>-.05</td>
<td>.19*</td>
<td>.24*</td>
</tr>
<tr>
<td>Interpersonal Distrust</td>
<td>.16</td>
<td>.16</td>
<td>.05</td>
<td>.00</td>
<td>.14</td>
</tr>
<tr>
<td>Interoceptive Awareness</td>
<td>.28*</td>
<td>.30*</td>
<td>.16</td>
<td>.07</td>
<td>.15</td>
</tr>
<tr>
<td>Maturity Fears</td>
<td>.06</td>
<td>.11</td>
<td>.11</td>
<td>.14</td>
<td>-.08</td>
</tr>
</tbody>
</table>

*p<.05
n=87

Third, SMI Pre and Post scores (body size) were expected to be positively correlated with estimated actual body size (EABS), DISTORT and DISCREP scores. Table 23 summarizes these findings. The SMI Pre correlated with EABS (r=.76, p<.001) and DISCREP (r=.26, p<.01), but not with
DISTORT \((p=.08)\). The SMI Post correlated with DISTORT \((r=.20, p<.05)\), DISCREP \((r=.24, p<.05)\), and EABS \((r=.72, p<.001)\).

Table 23.

Pearson Correlations for SMI Pre and Post with DISTORT, DISCREP, and EABS

<table>
<thead>
<tr>
<th></th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISTORT</td>
<td>-.15</td>
<td>.20*</td>
</tr>
<tr>
<td>DISCREP</td>
<td>.26*</td>
<td>.24*</td>
</tr>
<tr>
<td>EABS</td>
<td>.76*</td>
<td>.72*</td>
</tr>
</tbody>
</table>

\*\(p<.05\)
\(n=87\)

Finally, it was hypothesized that self-esteem (SAI) and body esteem (BES) would be negatively correlated with eating disorder proneness (EDI), body size estimation (SMI-A and B), estimated actual body size (EABS), body size distortion (DISTORT) and body size discrepancy (DISCREP). A summary of these correlations is found in Table 24. It was noted that the SAI total was inversely related to the EDI total \((r=-.52, p<.0001)\), SMI Pre and Post \((r=-.35 \text{ and } -.38, \text{ respectively, } p<.0001)\), and EABS \((r=-.24, p<.05)\), but not with DISTORT and DISCREP \((p>.10)\). There was an inverse relationship between the Confidence subscale of the SAI (Conf) and DISCREP \((r=-.27, p<.01)\). The Perfectionism
subscale of the EDI was not correlated with any SAI scales.

Table 24.

Pearson Correlations for SAI and BES with EDI, SMI Pre and Post, EABS, DISTORT, and DISCREP

<table>
<thead>
<tr>
<th></th>
<th>SAI Total</th>
<th>Conf</th>
<th>Pop</th>
<th>BES Total</th>
<th>SA</th>
<th>WC</th>
<th>PC</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDI Total</td>
<td>-.52*</td>
<td>-.58*</td>
<td>-.20*</td>
<td>-.69*</td>
<td>-.47*</td>
<td>-.74*</td>
<td>-.40*</td>
</tr>
<tr>
<td>Drive for Thinness</td>
<td>-.31*</td>
<td>-.41*</td>
<td>-.13</td>
<td>-.61*</td>
<td>-.37*</td>
<td>-.72*</td>
<td>-.30*</td>
</tr>
<tr>
<td>Bulimia</td>
<td>-.38*</td>
<td>-.39*</td>
<td>-.27*</td>
<td>-.45*</td>
<td>-.32*</td>
<td>-.49*</td>
<td>-.26*</td>
</tr>
<tr>
<td>Body Dissatisfaction</td>
<td>-.37*</td>
<td>-.44*</td>
<td>-.19*</td>
<td>-.68*</td>
<td>-.35*</td>
<td>-.85*</td>
<td>-.34*</td>
</tr>
<tr>
<td>Ineffectiveness</td>
<td>-.67*</td>
<td>-.69*</td>
<td>-.47*</td>
<td>-.59*</td>
<td>-.56*</td>
<td>-.43*</td>
<td>-.47*</td>
</tr>
<tr>
<td>Perfectionism</td>
<td>-.09</td>
<td>-.05</td>
<td>-.10</td>
<td>-.17</td>
<td>-.06</td>
<td>-.22*</td>
<td>-.11</td>
</tr>
<tr>
<td>Interpersonal Distrust</td>
<td>-.44*</td>
<td>-.44*</td>
<td>-.32*</td>
<td>-.19*</td>
<td>-.25*</td>
<td>-.08</td>
<td>-.17</td>
</tr>
<tr>
<td>Interoceptive Awareness</td>
<td>-.43*</td>
<td>-.49*</td>
<td>-.25*</td>
<td>-.47*</td>
<td>-.37*</td>
<td>-.46*</td>
<td>-.29*</td>
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*p < .05
n = 87
The BES total was found to be inversely related to the EDI Total (r=-.69, p<.001), SMI Pre and Post (r=-.58 and -.47, respectively, p<.001), but not related to DISTORT and DISCREP. However, the Sexual Attractiveness subscale of the BES was positively correlated to DISTORT (r=.18, p<.05), while the Weight Concern subscale was negatively correlated with DISCREP (r=-.26, p<.01).

Summary of Results

The results of statistical analysis provided support for the null hypothesis that OSA would not be induced by the two experimental groups. Thus, the other experimental hypotheses, which were premised on the induction of OSA, could not be adequately tested. Since OSA was not induced, neither pretest - posttest changes nor between-group posttest differences would be expected. The results were essentially consistent with this latter statement.

Statistically significant results within the correlational analyses warrant the following general statements to be made with regard to the hypotheses:

1. Self-esteem correlated positively to body esteem.
2. There was no correlation between self-reported distortions in body size estimations and discrepancies of self-estimates versus others' estimates of body size.
3. Body size distortion was not found to be correlated with self-consciousness or eating disorder proneness, but was observed to be positively correlated with perfectionist attitudes and feelings of sexual attractiveness.

4. Body size discrepancies were observed to be positively correlated with body size estimation. Discrepancies were also positively correlated with eating disorder proneness and specifically with tendencies toward personal ineffectiveness, as well as with private and public self-consciousness (but not with overall self-consciousness).

5. Body size estimates were found to be positively correlated with eating disorder proneness, but not with self-consciousness.

6. Eating disorder proneness was found to be positively correlated with self-consciousness, body size discrepancies and body size estimates, but not with body size distortions.

7. Self-esteem and body esteem were both negatively correlated with self-consciousness and eating-disorder proneness.
Eating disorder research has utilized methods for measuring body size distortion which are quite similar to those methods used by Duval and Wicklund (1972) and several others to induce heightened states of objective self-awareness (OSA). Much of the OSA research has utilized the presence of a mirror and video camera (e.g., Brockner et al., 1985; Carver, 1975; Gibbons, 1983) and an audience (e.g., Carver & Scheier, 1978; Shrauger, 1972). OSA has been assessed by use of the Self-Consciousness Scale developed by Fenigstein et al. (1975) and later by the revised version developed by Scheier and Carver (1985).

The results of the present study revealed no meaningfully significant changes in the self-consciousness measure from baseline to experimental conditions within-groups, nor between posttest control and experimental conditions. Thus, it can be concluded that the procedures used in eating disorder research on body image do not necessarily induce heightened OSA, at least when applied in a nonclinical, non-eating-disordered population.

There may be several explanations for this finding.
One explanation which may be possible but not likely is that the SCSR is generally less sensitive to changes in OSA than anticipated. This seems unlikely, given its standard usage in OSA research for the expressed purpose of assessing levels of OSA. It is also unlikely that the lack of change was due to a ceiling effect, since group means in the present study were highly similar to norms for females reported by Fenigstein et al. (1975) and Scheier and Carver (1985).

A possible contributing factor to the absence of experimental effect is that the treatments (i.e., the two experimental conditions) were not powerful enough to induce OSA. It may be that extraneous variables such as the sex of the researcher or the non-threatening appearance of the Counseling Center facility had an impact on levels of self-consciousness.

A more plausible explanation for the nonsignificant findings in experimental effect is that the nature of the study screened out some individuals in the population sampled. For ethical reasons, recruits were told about the silhouette photograph prior to their agreeing to participate. Several women declined to participate upon hearing about the photograph even though privacy and anonymity were assured, reporting to the researcher that they did not feel comfortable with the procedure and would feel embarrassed. Thus, it is possible that the recruitment
procedures inadvertently selected out the persons who would have been most susceptible to the experimental conditions and assessments.

Another possible factor is that several studies concerned with the relationship of self-esteem to induced OSA have indicated that OSA is more likely to be reported in subjects with low self-esteem. Shrauger (1972) and Brockner and Hulton (1978) reported that when self-focusing stimuli (i.e. mirror and audience) were introduced into the experimental situation, the performance of subjects with low self-esteem dropped off significantly, while the high self-esteem subjects continued as they were prior to the introduction of OSA-inducing procedures. Brockner (1979) suggested that although low self-esteem individuals are not necessarily more self-conscious already than high self-esteem individuals, they appear to be more susceptible to the effects of self-focused attention. In a more recent study (Brockner et al., 1985), the experimental effect of inducing OSA was attributed to the low self-esteem subjects and not to those with moderate to high self-esteem. The negative correlations of self-esteem and body esteem to self-consciousness in the present study may lend credence to the explanation that the absence of self-consciousness was attributable at least in part to varying levels of self-esteem. This idea is further supported by the moderate positive correlations between self-consciousness and eating-
disorder proneness, in that those subjects highly similar to diagnosed eating disorder patients are more concerned with their appearance to others (public self-consciousness) and have considerably lower levels of self-esteem. Indeed, in the present study, Public Self-Consciousness was the SCSR subscale with the highest correlations to the Eating Disorder Inventory and all of its subscales.

However, the most likely explanation for the absence of heightened OSA in the present study is that the procedures used here and in eating disorder research require that the individual focus on the equipment and the situational variables rather than on their internal states. This external focus draws attention away from the self, so that the individual is less self-aware. This is related in part to the idea that the tasks involved could be inherently interesting, again drawing attention away from self and toward the task (Brockner, 1979; Brockner & Hulton, 1978; and Shrauger, 1972). This notion is supported by the results of debriefing, in which subjects from the two experimental conditions reported that they were briefly aware of those conditions, but soon became focused on the task alone because it was so interesting.

**Body Size Estimation**

While the experimental hypotheses with regard to body
size estimates were not testable due to the absence of heightened OSA, some significant correlations are worth discussing. First, estimates of body size were positively correlated with eating-disorder proneness. This suggests that eating-disorder similarity is related to larger estimates of body size, as has been noted in much of the literature (e.g. Bell et al, 1986; Garfinkel et al, 1978; Garner, 1981). It is not known, however, if larger body size estimates are due to overestimates associated with eating disorder tendencies, or to larger actual body size associated with eating disorders. There was a similar but less prevalent trend regarding body size discrepancy (the difference between body size estimates by self and objective raters) and eating disorder tendencies. Again, this suggests that individuals who are prone to having an eating disorder see themselves as being larger than would an objective observer.

It is of interest that discrepancy scores correlated the most highly with the Ineffectiveness subscale of the EDI, since ineffectiveness in that context has to do with one's feelings of being inadequate, insecure, and out of control of one's life. It might stand to reason, then, that these individuals' self-estimates would be different than other's estimates of them.

It is of further interest to note that body size distortion was correlated most highly with the Perfectionism
subscale of the EDI. This might be due to increased sensitivity and instability regarding physical imperfections.

Limitations of the Research

There are several limitations to the present research. The most obvious limit is the absence of significant heightened OSA. It remains unknown how subjects might have responded in regard to body size estimates, had OSA been successfully induced across the entire sample. The present research is unable to confirm the reason or reasons for the nonsignificant findings. It could be that the body image procedures differ enough from the OSA-inducing procedures in terms of the direction of attention that OSA cannot be induced under those conditions. Further research would be helpful in delineating this possibility more clearly.

Another limitation of the current research is that it is not automatically generalizeable to body image research with eating disordered subjects. The next logical step would be to conduct a similar study with an eating disordered sample, to see if similar findings result.

A related limitation in this regard is that recruitment procedures may have biased the sample away from individuals who might have been more influenced by the OSA conditions (i.e. those with low self-esteem or higher than average self-consciousness). This limit could be explored by
conducting the same study without the silhouette photograph, so that subjects are not desensitized to the experimental procedures, as well as by dividing the sample according to level of self-esteem and assessing possible differences.

The current study is limited as well in its generalizability to eating disorder research. As was stated in the objectives, this was to be a preliminary study, examining the research questions in a general population prior to pursuing these questions in an eating-disordered sample. The next logical step would be to conduct similar research with eating-disordered subjects, particularly given the strong correlation between self-consciousness and eating disorder proneness.

Overall generalizability for the present study is also compromised. Out of 87 subjects, only two were non-caucasian in ethnicity, due to the predominance of that group in the population sampled. Although not a part of the demographic data compiled in this study, the religious preference of both the area surrounding Utah State University and the university population itself is Mormonism, a relatively conservative political and religious group. Thus, the findings presented here reflect a typically white, conservative, and largely middle class population and may not be generalizable to more heterogeneous groups, or to homogeneous but different groups.
Still another limit of the present research is that it failed to control for effects of researcher characteristics such as age, sex, appearance, and perceived authoritative-ness, or for the demand characteristics of the instruments themselves. It is possible that a male researcher or observer/rater, for instance, could have had a different effect than the females in this study. Also, because the measures used were straightforward and involved no masking per se, it is possible that subjects found them easy to interpret and respond to in what they perceived to be a socially acceptable manner.

In addition to other limitations, it is possible that some of the eating disorder correlations were spurious in nature due to a highly skewed curve. Most subjects scored within average limits, but some of the subjects scored well above the norms, in the eating-disordered range, thus affecting overall means.

The research design employed (pretest-posttest control group) generally controls for threats to internal validity such as history, maturation, mortality, testing, instrumentation, and differential selection in the control versus experimental groups (Borg & Gall, 1983). It does not control for what effect the pretest may have on posttest scores. However, in this research, there was so little difference between the two that this limitation is not of major concern.
CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

Although the statistical findings of the experimental data were insignificant, there are two important conclusions about those findings. First, had the results indicated significant changes in body estimates as a function of self-consciousness, they would have called into question much of the research on body image measurement for its failure to control for self-consciousness during the procedures. Should controlled replications of the present study produce similar results, the findings reported here would have clinically important ramifications, in that the procedures used in body image measurement would be further validated.

Secondly, the very strong correlation (i.e., lack of significant difference) between pretest and posttest estimates of body size may indicate that body size perception is very stable across a variety of situations. This would support assertions by several authors that body image is highly stable and relatively resistant to change (e.g., Bruch, 1981; Garfinkel, 1981; Garner, 1981). The implication of this stability in terms of treatment is that alteration of body image perception would need to become a primary focus of therapy in order for complete recovery to occur.
In light of the results and limitations of this research, the following conclusions are warranted:

1. Heightened objective self-awareness is probably influenced by factors other than the ones presently accounted for (such as self-esteem, eating disorder proneness, and preexisting tendency to be self-conscious).

2. Objective self-awareness (as measured by the SCSR) appears to be negatively related to self-esteem and body esteem, and positively related to eating disorder tendencies. These findings support earlier research suggesting that individuals with high self-esteem are less susceptible to feeling self-conscious (Brockner, 1979; Brockner et al., 1985, Brockner & Wallnau, 1981, Shrauger, 1972). They would dispute the finding by Ickes et al. (1973) that decreased self-esteem was induced by the OSA conditions.

3. Support was garnered for prior research regarding the positive relationship between self-esteem and body esteem (Rosen & Ross, 1968; Zion, 1963) and regarding the negative relationship between self- and body-esteeem and OSA (Korabik & Pitt, 1980). The results also support much of the existing research regarding the relationship between low self- and body-esteem and eating disorder problems.
Finally, some recommendations for future research are in order. First, an exploration of the limit imposed by inadvertent sampling bias should be pursued. A sample should be extracted without the silhouette photograph being utilized, so as not to run the risk of screening out more self-consciousness prone individuals. Second, a preliminary study of OSA alone could be conducted, utilizing various methods of OSA induction and comparing them for effect. Also it might be expedient to examine more fully the range of variables that may contribute to self-consciousness, such as self-esteem. Thirdly, similar research needs to be conducted with an eating disorder group since it is reasonable to assume that their responses might be somewhat different from a general population (given the results of the correlational analyses). Finally, replications should take into account the possible experimental demand characteristics mentioned in the limitations section.

Since the experimental hypotheses regarding body size estimation were neither supported nor rejected (due to absence of experimental effect), the concerns mentioned in the review of literature of this study should not be dismissed.
REFERENCES


Appendix A

Diagram of Silhouette Screen Apparatus
Overhead Projector

Subject

Silhouette Screen

Polaroid Camera
Appendix B

Study 1 Research Consent Form
RESEARCH CONSENT FORM

I hereby give my consent to participate in research conducted by a doctoral student in the Psychology Department at Utah State University. I understand that the research will include a few brief questionnaires, a silhouette photograph of myself, and possible brief videotape session.

I understand that silhouette photos will be identified by subject number rather than by name, as will the questionnaires. I understand that all data collected will be held in strictest confidence and will be used only for the present research. If videotapes are made, they will be destroyed within two weeks of the conclusion of the research.

I further understand that I may withdraw from the research at any time.

Signed by: ___________________________ Date: __________

Witnessed by: ___________________________ Date: __________
Appendix C

Study 1 Demographic Information Card
ID#_________________

Name____________________________________
Address____________________________________
Phone(s)____________________________________
Date of 1st Session__________________________
Date of next expected menstruation______________
(If unsure of date, or if cycle is not regular, see experimenter after this session)
Appendix D

Revised Research Consent Form
RESEARCH CONSENT FORM

I hereby give my consent to participate in research conducted by a doctoral student in the Psychology Department at Utah State University. I understand that the research will include a few brief questionnaires, a silhouette photograph of myself, and possible exposure to videotape equipment.

I understand that the silhouette photos, as well as the questionnaires, will be identified by my assigned subject number rather than by my name. I also understand that all data collected will be held under strictest confidence in a locked office and locked file, and will be used only for this research. I further understand that I may withdraw from the study at any time and that my participation is voluntary.

In order to protect research standards, I agree to not discuss the content of the research with anyone, until the entire project has been completed and I have received my letter concerning the study's outcome.

Signed By: ______________________ Date: ____________
Address: ______________________ Phone: ____________
Witnessed By: __________________ Date: ____________

revised 10/89
Appendix E

Demographic Information Sheet
Demographic Information Sheet

AGE: ____________________

STUDENT STATUS:
___ Freshman
___ Sophomore
___ Junior
___ Senior
___ Graduate

ETHNICITY:
___ Caucasian
___ Black American
___ Native American
___ Hispanic
___ Asian American
___ International
(Country: ____________ )

MARITAL STATUS:
___ Single
___ Divorced
___ Married

CHILDREN:
___ Yes
___ No

Date of 1st research session: ____________________

Date of next expected menstruation: ____________________
(If you are unsure of date, or if cycle is not regular, see experimenter sometime during the session)

ID# _______________
Appendix F

Instructions for Baseline and Experimental Groups
INSTRUCTIONS FOR
TEST ADMINISTRATIONS

PRETEST/BASELINE: Here are two questionnaires for you to complete. The first one consists of a series of silhouettes in random order. Please look at each silhouette and decide which one is the most like your own. Place the number of that silhouette in the space provided on the data sheet. The second questionnaire is a series of statements that you can respond to using the key provided. Please read the directions. Do you have any questions?

CONTROL GROUP: These are the same two questionnaires you took the first time. There is one difference, which is that these silhouettes are in a different random order, so the one you chose before may not be in the same place or have the same number. Please respond to both questionnaires according to how you see things today. You don't have to try to recall what you marked the first time.

VCR/MIRROR GROUP: These are the same two questionnaires you took the first time. There are two differences. First, the silhouettes are in a different random order, so the one you chose before may not be in the same place or have the same number. The other difference is that you are to use the feedback from the VCR and mirror to assist you in thinking about yourself and answering the questionnaires...(etc.)

OBSERVER/RATER GROUP: ...The other difference is that I will be staying here with you to estimate your body size on the silhouette chart myself, and to take notes on your physical appearance and behaviors...(etc.)
Appendix G

Self-Attitude Inventory
Self-Attitude Inventory

Maurice Lorr, Ph.D.
Catholic University, 1985
Washington, D. C.

Directions

This booklet contains a number of statements that describe how people feel about themselves and how they relate to others. You will notice that each numbered item has two possible answers labelled A and B. Read each statement and select the one (either A or B) you agree with most. Then on the Answer Sheet find the number of the item and draw a circle around the A or the B, whichever describes you best. Be sure to circle one answer for each item.

1. A. I usually feel confident in my abilities.
   B. I often lack confidence in my abilities.

2. A. I have few doubts that I am popular.
   B. I have real doubts about my popularity.

3. A. I usually expect to succeed in things I try.
   B. Only occasionally do I expect to succeed in things I try.

4. A. Not many people think well of me.
   B. Most people think well of me.

5. A. There are only a few things I can do that I am proud of.
   B. There are a fair number of things I can do that I am proud of.

6. A. I seldom feel approved or noticed by people I like.
   B. I usually get both approval and attention from people I like.

7. A. I feel sure of myself in most circumstances.
   B. I feel sure of myself only in a few situations.

8. A. Few people say they like being with me.
   B. Most people say they like being with me.

9. A. I can usually accomplish everything I set out to do.
   B. Often I am unable to accomplish what I set out to do.

10. A. People seldom go out of their way to include me in their affairs.
    B. People often go out of their way to include me in their affairs.

11. A. I feel as capable as most people I know.
    B. I feel less capable than a fair number of people I know.

12. A. Few people consider me to be an interesting person.
    B. I feel that a lot of people consider me to be an interesting person.
13. A. I feel unsure whether I can handle what the future brings.
   B. I feel sure I can handle whatever the future is likely to bring.

14. A. A fair number of people seem to look up to me.
   B. Very few people seem to look up to me.

15. A. I tend to be optimistic when I take on a new job.
   B. I tend to expect failure when I take on a new job.

16. A. A fair number of persons say positive things about me.
   B. Relatively few people say nice things about me.

17. A. I seldom feel satisfied with myself.
   B. I usually feel pleased with myself.

18. A. I feel accepted by most people important to me.
   B. I feel accepted only by some people important to me.

19. A. Most people I know would rate me as a self-assured person.
   B. Few people I know would rate me as a self-assured person.

20. A. I seem to get more social invitations than my friends do.
    B. I seem to get fewer social invitations than my friends do.

21. A. I often feel I can't do anything right.
    B. Usually I can do whatever I set my mind to.

22. A. Often people confide in me.
    B. It is seldom that people confide in me.

23. A. I have a record of fewer successes than failures.
    B. I have a record of more successes than failures.

24. A. Only a few people enjoy associating with me.
    B. Many people like to associate with me.

25. A. I usually expect to win when competing with others.
    B. I seldom expect to win when competing with others.

26. A. Few people tell me they enjoy my company.
    B. Most people say they enjoy my company.

27. A. I probably think less favorably of myself than the ordinary person does.
    B. I think more favorably of myself than the ordinary person does.

28. A. Not many people seem to value my friendship.
    B. Quite a few persons appear to value my friendship.

29. A. There are very few things I would change about myself.
    B. There are many things about myself I wish I could change.

30. A. I am often asked to voice my opinion in a group discussion.
    B. I am seldom asked to express an opinion in a group discussion.
31. A. I seldom reach the goals I set for myself.
    B. I usually reach the goals I set for myself.

32. A. My acquaintances don't seem to follow my suggestions.
    B. My acquaintances usually follow my suggestions.
Self Attitude Inventory

ANSWER SHEET

Circle either A or B

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ID# ___________________
22 April 1988

From: Mary E. Doty
255 W. Center-Bsmt.
Logan, Utah 84321
(801) 753-7344

Dear Dr. Lorr:

Thank you for sending me the copy of the materials I requested from you regarding the Self-Attitude Inventory (1986).

My dissertation committee has asked me to include written permission for the use of your materials in the appendix of my paper.

Please indicate your approval of this request by signing the space provided, attaching any other form or instruction necessary to confirm permission. If you charge a reprint fee for use of your material, please indicate that as well. If you have any questions, please call me at the number above.

I hope you will be able to reply immediately. I have included a self-addressed stamped envelope for your convenience. If you are not the copyright holder, please forward my request to the appropriate person or institution.

Thank you for your cooperation.

Sincerely,

Mary E. Doty, M.S.

I hereby give permission to Mary E. Doty to reprint the following material in her dissertation.

Description: Self-Attitude Inventory and SAI Answer Sheet. Tables applying to reliability/validity and normative information if needed.

(Fee)

(Signature)
Appendix H

Body Esteem Scale
THE BODY ESTEEM SCALE

Instructions: On this page are listed a number of body parts and functions. Please read each item and indicate how you feel about this part or function of your own body using the following scale:

1 = Have strong negative feelings
2 = Have moderate negative feelings
3 = Have no feeling one way or the other
4 = Have moderate positive feelings
5 = Have strong positive feelings

1. body scent
2. appetite
3. nose
4. physical stamina
5. reflexes
6. lips
7. muscular strength
8. waist
9. energy level
10. thighs
11. ears
12. biceps
13. chin
14. body build
15. physical coordination
16. buttocks
17. agility
18. width of shoulders
19. arms
20. chest or breasts
21. appearance of eyes
22. cheeks/cheekbones
23. hips
24. legs
25. figure or physique
26. sex drive
27. feet
28. sex organs
29. appearance of stomach
30. health
31. sex activities
32. body hair
33. physical condition
34. face
35. weight
THE BODY ESTEEM SCALE

(score keys)*

**Females**

Sexual Attractiveness: body scent, nose, lips, ears, chin, chest or breasts, appearance of eyes, cheeks/cheekbones, sex drive, sex organs, sex activities, body hair, face

Weight Concern: appetite, waist, thighs, body build, buttocks, hips, legs, figure or physique, appearance of stomach, weight

Physical Condition: physical stamina, reflexes, muscular strength, energy level, biceps, physical coordination, agility, health, physical condition

**Males**

Physical Attractiveness: nose, lips, ears, chin, buttocks, appearance of eyes, cheeks/cheekbones, hips, feet, sex organs, face

Upper Body Strength: muscular strength, biceps, body build, physical coordination, width of shoulders, arms, chest or breasts, figure or physique, sex drive

Physical Condition: appetite, physical stamina, reflexes, waist, energy level, thighs, physical coordination, agility, figure or physique, appearance of stomach, health, physical condition, weight

*To determine subject's score for a particular subscale of the Body Esteem Scale, simply add up the individual scores given items on the subscale. For example, for female sexual attractiveness you would add up the subject's ratings of the items comprising the sexual attractiveness subscale (13 items).
22 April 1988

From: Mary E. Doty
255 W. Center-Bsmt.
Logan, Utah 84321
(801) 753-7344

Dear Dr. Franzoi:

Thank you for sending me the copy of the materials I requested from you regarding the Body Esteem Scale.

My dissertation committee has asked me to include written permission for the use of your materials in the appendix of my paper.

Please indicate your approval of this request by signing the space provided, attaching any other form or instruction necessary to confirm permission. If you charge a reprint fee for use of your material, please indicate that as well. If you have any questions, please call me at the number above.

I hope you will be able to reply immediately. I have included a self-addressed stamped envelope for your convenience. If you are not the copyright holder, please forward my request to the appropriate person or institution.

Thank you for your cooperation.

Sincerely,

Mary E. Doty, M.S.

I hereby give permission to Mary E. Doty to reprint the following material in her dissertation.

Description: Body Esteem Scale. Tables applying to reliability/validity and norms if necessary.

$0.00

(Fee)

(Signature)
Appendix I

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 fill in the circle under the column which applies best to you. Please answer each question very carefully. Thank you.

<table>
<thead>
<tr>
<th>Question</th>
<th>Always</th>
<th>Usually</th>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
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<tbody>
<tr>
<td>1. I eat sweets and carbohydrates without feeling nervous.</td>
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<td>2. I think that my stomach is too big.</td>
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<td>3. I wish that I could return to the security of childhood.</td>
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<td>4. I eat when I am upset.</td>
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<td>5. I stuff myself with food.</td>
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<td>6. I wish that I could be younger.</td>
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<td>7. I think about dieting.</td>
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<td>8. I get frightened when my feelings are too strong.</td>
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<td>9. I think that my thighs are too large.</td>
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<td>10. I feel ineffective as a person.</td>
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<td>11. I feel extremely guilty after overeating.</td>
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<td>12. I think that my stomach is just the right size.</td>
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<td>13. Only outstanding performance is good enough in my family.</td>
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<td>14. The happiest time in life is when you are a child.</td>
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<td>15. I am open about my feelings.</td>
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<td>16. I am terrified of gaining weight.</td>
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<td>17. I trust others.</td>
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<td>18. I feel alone in the world.</td>
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<td>19. I feel satisfied with the shape of my body.</td>
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<td>20. I feel generally in control of things in my life.</td>
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<td>21. I get confused about what emotion I am feeling.</td>
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<td>22. I would rather be an adult than a child.</td>
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<td>23. I can communicate with others easily.</td>
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<td>24. I wish I were someone else.</td>
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<td>25. I exaggerate or magnify the importance of weight.</td>
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<td>26. I can clearly identify what emotion I am feeling.</td>
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<td>27. I feel inadequate.</td>
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<td>28. I have gone on eating binges where I have felt that I could not stop.</td>
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<td>29. As a child, I tried very hard to avoid disappointing my parents and teachers.</td>
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<td>30. I have close relationships.</td>
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<td>ALWAYS</td>
<td>USUALLY</td>
<td>OFTEN</td>
<td>SOMETIMES</td>
<td>RARELY</td>
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<td>31.</td>
<td>I like the shape of my buttocks.</td>
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<td>32.</td>
<td>I am preoccupied with the desire to be thinner.</td>
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<td>33.</td>
<td>I don't know what's going on inside me.</td>
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<td>34.</td>
<td>I have trouble expressing my emotions to others.</td>
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<td>35.</td>
<td>The demands of adulthood are too great.</td>
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<td>36.</td>
<td>I hate being less than best at things.</td>
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<td>37.</td>
<td>I feel secure about myself.</td>
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<td>38.</td>
<td>I think about bingeing (over-eating).</td>
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<td>39.</td>
<td>I feel happy that I am not a child anymore.</td>
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<td>40.</td>
<td>I get confused as to whether or not I am hungry.</td>
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<td>41.</td>
<td>I have a low opinion of myself.</td>
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<td>42.</td>
<td>I feel that I can achieve my standards.</td>
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<td>43.</td>
<td>My parents have expected excellence of me.</td>
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<td>44.</td>
<td>I worry that my feelings will get out of control.</td>
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<td>45.</td>
<td>I think that my hips are too big.</td>
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<td>46.</td>
<td>I eat moderately in front of others and stuff myself when they're gone</td>
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<td>47.</td>
<td>I feel bloated after eating a normal meal.</td>
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<td>48.</td>
<td>I feel that people are happiest when they are children.</td>
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<td>49.</td>
<td>If I gain a pound, I worry that I will keep gaining.</td>
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<td>50.</td>
<td>I feel that I am a worthwhile person.</td>
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<td>51.</td>
<td>When I am upset, I don't know if I am sad, frightened, or angry.</td>
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<td>52.</td>
<td>I feel that I must do things perfectly, or not do them at all.</td>
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<td>53.</td>
<td>I have the thought of trying to vomit in order to lose weight.</td>
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<td>54.</td>
<td>I need to keep people at a certain distance (feel uncomfortable if someone tries to get too close).</td>
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<td>55.</td>
<td>I think that my thighs are just the right size.</td>
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<td>56.</td>
<td>I feel empty inside (emotionally).</td>
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<td>57.</td>
<td>I can talk about personal thoughts or feelings.</td>
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<td>58.</td>
<td>The best years of your life are when you become an adult.</td>
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<td>59.</td>
<td>I think that my buttocks are too large.</td>
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<td>60.</td>
<td>I have feelings that I can't quite identify.</td>
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<td>61.</td>
<td>I eat or drink in secrecy.</td>
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<td>62.</td>
<td>I think that my hips are just the right size.</td>
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<td>63.</td>
<td>I have extremely high goals.</td>
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<td>64.</td>
<td>When I am upset, I worry that I will start eating.</td>
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</tbody>
</table>
May 29, 1990

Ms. Mary E. Doty
710 N. 600 E. #1
Logan, Utah 84321

Dear Ms. Doty:

In response to your recent request, permission is hereby granted to you to include a copy of the Eating Disorder Inventory in the appendices of your dissertation entitled "Body Image and Self-Consciousness Among College Females".

This Permission Agreement is subject to the following restrictions:

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(3) Payment of a royalty/license fee will be waived.

(4) One copy of any of the material reproduced will be sent to the Publisher to indicate that the proper credit line has been used.

(5) One copy of your research results will be sent to the Publisher.

Both copies of this Permission Agreement should be signed and returned to me to indicate your agreement with the above restrictions. Please keep one copy for your records.

Sincerely,

R. Bob Smith, III, Ph.D.
President

Accepted and agreed:

By: ___________________________

DATE: 7-6-90
Appendix J

Silhouette Measurement Instrument
Appendix K

Self-Consciousness Scale/Revised
Please answer the following questions about yourself by placing the appropriate number in the space provided for each statement. For each of the statements, indicate how much each statement is like you by using the following scale:

3 = a lot like me
2 = somewhat like me
1 = a little like me
0 = not like me at all

Please be as honest as you can throughout, and try not to let your response to one question influence your responses to other questions. There are no right or wrong answers.

1. I'm always trying to figure myself out.
2. I'm concerned about my style of doing things.
3. It takes me time to get over my shyness in new situations.
4. I think about myself a lot.
5. I care a lot about how I present myself to others.
6. I often daydream about myself.
7. It's hard for me to work when someone is watching me.
8. I never take a hard look at myself.
9. I get embarrassed very easily.
10. I'm self-conscious about the way I look.
11. It's easy for me to talk to strangers.
12. I generally pay attention to my inner feelings.
13. I usually worry about making a good impression.
14. I'm constantly thinking about my reasons for doing things.
15. I feel nervous when I speak in front of a group.
17. I sometimes step back (in my mind) in order to examine myself from a distance.
18. I'm concerned about what other people think of me.
19. I'm quick to notice changes in my mood.
20. I'm usually aware of my appearance.
21. I know the way my mind works when I work through a problem.
22. Large groups make me nervous.
22 April 1988

From: Mary E. Doty
255 W. Center-Bsmt.
Logan, Utah 84321
(801) 753-7344

Dear Dr. Scheier:

Thank you for sending me the copy of the materials I requested from you regarding the Self-Attitude Inventory (1986).

My dissertation committee has asked me to include written permission for the use of your materials in the appendix of my paper.

Please indicate your approval of this request by signing the space provided, attaching any other form or instruction necessary to confirm permission. If you charge a reprint fee for use of your material, please indicate that as well. If you have any questions, please call me at the number above.

I hope you will be able to reply immediately. I have included a self-addressed stamped envelope for your convenience. If you are not the copyright holder, please forward my request to the appropriate person or institution.

Thank you for your cooperation.

Sincerely,

Mary E. Doty, M.S.

I hereby give permission to Mary E. Doty to reprint the following material in her dissertation.

Description: Self-Attitude Inventory and SAI Answer Sheet. Tables applying to reliability/validity and normative information if needed.

[Signature]
VITA

Mary Elizabeth Doty

Candidate for the Degree of

Doctor of Philosophy

Dissertation: Self-Consciousness and Body Image Issues Among College Females

Major Field: Psychology

Biographical Information:

Personal Data: Born in Schenectady, New York, June 16, 1952, daughter of Peter and Anita Doty.

Education: Received the Bachelor of Arts degree with a Social Work major from Eastern College, Saint Davids, Pennsylvania, in 1974; received the Master of Science degree in Applied Psychology from Southwestern Oklahoma State University, Weatherford, Oklahoma, in 1981; in 1990 completed the requirements for the Doctor of Philosophy degree in the Combined Professional-Scientific Psychology Program at Utah State University, Logan, Utah, with a specialty in Clinical Psychology.

Professional Experience: 1981-1983, outpatient therapist at New Horizons Community Mental Health Center, Clinton, Oklahoma; 1984-1987, graduate assistant/therapist at Utah State University Counseling Center, Logan, Utah; outpatient therapist, Bear River Mental Health, Logan, Utah; 1988-1989, intern in clinical psychology, Veterans Medical Center, Coatesville, Pennsylvania; 1989 to present, staff psychologist, Utah State University Counseling Center, Logan, Utah.