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THE EFFECT OF A SELF CONTROL MANIPULATION ON BODY IMAGE DISTORTION AND EATING BEHAVIOR IN ANOREXIA AND BULIMIA NERVOSA

by

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ABSTRACT

The effect of positive or negative self-control feedback on body image distortion and eating behavior was investigated in seventeen patients with anorexia nervosa (restricters), twenty patients with bulimia nervosa (bulimics) and twenty-six normal weight controls. Subjects first completed a number of psychometric measures, including a self concept scale and measures related to self-control and eating behavior. A stereotype measure was also included, which required participants to rate photographs of different sized women on a number of dimensions. It was anticipated that weight stereotypes might mediate the relationship between self-control feedback and the dependent measures, body image distortion and eating behavior.

Body image distortion was measured using a distorting video camera technique prior to the feedback manipulation, following the feedback and finally, following a standard meal. The feedback manipulation involved informing participants that their level of self control, according to scores on questionnaires they had completed, was higher (positive condition) or lower (negative condition) than they had indicated on a self-rating scale.

Univariate analyses indicated that self-control feedback alone had no effect on body image distortion. However, following the ingestion of food, restricters receiving negative feedback showed an increase in body image distortion relative to

controls, while bulimics receiving positive feedback showed a decrease in body image distortion relative to restricters and controls. This is interpreted in terms of a "priming effect" of feedback, which renders eating disorder patients more sensitive to body changes, hence vulnerable to size overestimation, after eating a meal.

A principal components analyses of the psychometric data indicated that self concept, eating pathology and self control factors had different patterns of relationship to body size overestimation for restricters, bulimics and controls. A principal components analysis of the stereotype data suggested that all subjects adhered to weight stereotypes ascribing greater competence and likeability to thin versus fat women. However, only in restricting anorexics were these stereotypes positively related to body size overestimation.

The results are discussed in terms of possible maintaining variables in anorexia and bulimia nervosa, with some suggestions as to the implications of these results for intervention programs.

DEDICATION

To Darryn Geeroms

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A. Introduction

The closely related disorders, anorexia nervosa and bulimia nervosa, are psychological disorders with a prognosis ranging from complete recovery to death (Hsu, 1980). Once thought very rare, recent reports suggest a rising incidence (Crisp, Palmer & Kalucy, 1976). Although deemed of primarily psychogenic origin, the clinical presentation is complicated by various physiological, behavioral and sociocultural factors. Psychodynamic, behavioral and family interaction models and physiological as well as endocrinological theories of causation have been advanced. Treatments derived from each of these formulations have been attempted, without definitive success. In short, over 100 years since it was initially identified, anorexia nervosa remains a confounding disorder.

Recent attempts to understand and treat anorexia and bulimia have recognized the multi-dimensional nature of these disorders (Garfinkel & Garner, 1982). This review will maintain a similar multi-dimensional perspective, considering some of the possible predisposing, precipitating or maintaining variables in the disorder. This study will focus on selected individual, family, and sociocultural factors.

Anorexia nervosa occurs chiefly in young women or girls, with onset from pre-teens up to mid-30's, or later, and only occasionally in males (Dally, 1969). A rising incidence in

recent years has been suggested by Crisp et al. (1976) and Duddle (1973). This is thought to be true also, for "subclinical" cases, which though not fitting strict diagnostic criteria for anorexia nervosa, display unusual eating and weight concerns (Button & Whitehouse, 1981; Garner & Garfinkel, 1979).

Other studies, citing an incidence of .37 to 5.8 per 100,000, have reported an increase in recent decades of the number of anorexics seeking treatment (Jones, Fox, Babigian & Hutton, 1980; Kendell, Hall, Hailey & Babigian, 1973; Theander, 1970). In a study of schoolgirls in England in the 70's, one new case in 250 pupils age 16 and over was identified (Crisp, Palmer & Kalucy, 1976), a similar rate to that reported by Nylander in Sweden (1971).

In general, the consensus apears to be that (1) the incidence of anorexia nervosa is rising, and (2) the incidence of a milder form of the illness, not included in such figures, is also rising.

I. History

The anorexia nervosa syndrome was first described by Morton in 1694, and more recently by Gull (1873) and Lasegue (1874). Gull described "anorexia which led to starvation ... great emaciation and apparent weakness ..." with "a peculiar restlessness, difficult, I was informed, to control" (pp. 133, 134). Using the term anorexia nervosa, he described an instance of the illness which led to death apparently due only to starvation.

Independently, and concurrently, Lasegue described "hysterical anorexia" in a patient with "diminished appetite and the conviction that food will prove injurious" (Lasegue, 1874, p. 145). Both physicians postulated a psychic basis for the illness, and Lasegue speculated about the psychological influences on appetite control He described intrafamily conflict, with the anorexia becoming "the sole object of preoccupation and conversation", and the pleas to eat more, which "excess of insistence begets an excess of resistance" (p. 149). Gull, and later, Charcot, similarly recommended that patients be cared for "by persons with moral control over them, relations and friends being the worst attendants (p. 316).

Lasegue recognized the anorexic's denial of illness in their "state of quietude - I might almost say a condition of contentment truly pathological" (p. xx). Gull and Lasegue both

noted the absence of underlying physical disease inherent in a diagnosis of anorexia nervosa. Later, Janet (1929) discussed the propensity of such patients to exercise excessively, due, he thought, to a suppression of the feeling of fatigue.

These initial descriptions of the classical anorexic reflect many of the core symptoms used in arriving a diagnosis of anorexia even today.

II. Clinical Picture and Diagnostic Issues

Despite the striking presentation of the "classical" anorexic, there is some disagreement about the critical features of the disorder, the boundaries of the diagnosis, and its relationship to other eating disorders. The cardinal feature of anorexia nervosa is extreme loss of body weight, resulting from the refusal to eat due to fear of weight gain or aversion to food, in the absence of organic disease. It occurs primarily in pubertal or young adult females, although it is also known to occur in males (Bruch, 1973; Theander, 1970; Dally, 1969).

On the basis of her extensive clinical experience Bruch (1973) has derived criteria for anorexia nervosa which include a disturbance in body image and body concept, and a disturbance in the cognitive interpretation of bodily stimuli, i.e. nutritional needs, fatigue, sexual feelings, and emotional states. Furthermore, anorexics emphatically deny their emaciation, a characteristic pathognomic of the illness. Another central feature of the disorder is an overwhelming sense of ineffectiveness; anorexics "feel under the influence and direction of external forces" (p. 55). Because of their lack of inner-directedness and feelings of inadequacy, size control becomes their primary means of self-assertion; a way of exercising control over and ownership of their bodies. Bruch (1978) and others interpret the fear of becoming fat as, in

effect, an avoidance of pubertal development, with its connotations of sexual maturity and demands for autonomy and separation from the family. Paradoxically, refusal to eat is an assertion of independence; this struggle is thought to be central to the illness by Bruch and others (Dally & Gomez, 1979). To gain a better understanding of anorexia, Bruch points out the need to discover the personal meanings and interpretations given by patients to events and things, such as body size, food or parental wishes. Similarly, Garner and Bemis (1982) point to the role of cognitive distortions in the development and maintenance of the disorder.

Sours (1973) differentiates primary and secondary features; primary signs include willful and deliberate restriction of food intake, presented by the patient as a lack of appetite. The "relentless pursuit of thinness" becomes uppermost in the patient's life (Bruch, 1978, p. ix). There is a "frenetic effort, experienced with great pleasure, to establish control over the body and its instinctual life, a motive that is central to the illness" (Sours, 1973, p. 423). Avoidance of and obsession with food and eating are a part of the syndrome (Russell, 1979). The anorexic may like to cook for and feed others, collect recipes, or take gourmet cooking courses, yet avoids eating. Frequently seen are hyperactivity and increased energy. The patient may engage in prolonged exercise, for example, running long distances or doing strenuous calisthenics to burn off calories (Sours, 1973), or become preoccupied with

school achievement, spending long hours studying, a reflection of their perfectionism or high need for achievement (Bruch, 1978). The other primary symptoms include amenorrhea, which may even occur before the eating disorder is evident, and in some cases, bulimia, or binge eating (Bemis, 1978; Bruch, 1973; Sours, 1973). Secondary symptoms of anorexia nervosa, according to Sours, are manipulation of the environment, with refusal to eat as the means, distrust of those around the patient, and sadness and guilt stemming from ambivalence about her illness.

A similar distinction between primary or typical and secondary or atypical anorexia is made by Dally and Gomez (1979). Their criteria for anorexia include:

> 1. Active refusal by the patient to eat enough to maintain a normal weight, and/or determined sustained efforts to prevent ingested food from being absorbed.
> 2. Loss of at least 10% of previous body weight.
> 3. Amenorrhea of at least three months duration when menstruation has previously been regular. If menstruation has been irregular, with gaps of two or more months, the period of amenorrhea must be six months or more.
> 4. The patient's age of onset should be between 11 and 35 years. But we recognize that atypical anorexia nervosa can occur at any time after this.
> 5. There must be no sign of organic disease which might account for weight loss, serious affective disorder, or schizophrenia. (p.12)

Secondary anorexia nervosa differs from the above in that weight loss is not strictly a result of the pursuit of thinness, but is used as a means of manipulating others in the environment, paralleling the view of Sours. Body image and body concept disturbances are not predominant. Other features may differ from the typical pattern, e.g. age of onset is later than

usual, amenorrhea may occur later, appetite is more like to be genuinely absent, whereas primary anorexics will admit to feelings of hunger. Dally et al. described primary anorexia nervosa as a "disorder of maturation, sparked off by puberty", whereas in secondary anorexia nervosa, "weight loss is secondary to neurotic conflicts and difficulties in someone with a more developed personality" (p.19). The prognosis may be equally poor in both forms.

Other features which are central in anorexia include distorted body image and perceptual disturbances (Garfinkel, 1974; Slade & Russell, 1973; Strober, Goldenberg, Green & Saxon, 1979), lowered libido, denial of illness, resistance to treatment, and unpleasant feelings of guilt after eating (Bruch, 1973; Russell, 1977).

Although a fear of fat and pursuit of thinness is evident in all anorectics, those who achieve their goal by food restriction (restricters or abstainers) have been differentiated from those who binge eat and vomit or abuse laxatives to control weight gain (vomiters or bulimics) (Ben-Tovim, Whitehead & Crisp, 1979; Beumont, 1977; Garfinkel, Moldofsky & Garner, 1980).

Some recent researchers have suggested that bulimia nervosa (sometimes called bulimarexia; Boskind-Lodahl, 1976) is a subtype of anorexia nervosa (Beumont, George & Smart, 1976; Casper, Eckert, Halmi, Goldberg & Davis, 1980; Russell, 1979). Others hold that bulimia is an end point of anorexia, or that it

is a completely distinct disorder. Patients who binge and/or vomit have been found to differ from "dieters" or "restricters" on several dimensions and have a poorer prognosis(Beumont et al.,1976; Russell, 1979; Strober et al., 1979). Bulimic patients display more impulsivity in areas such as alcohol and drug use, stealing, self-mutilation and suicide (Casper et al., 1980; Hatsukami, Eckert, Mitchell & Pyle, 1984; Garfinkel, Moldofsky & Garner, 1980; They are more likely to have been obese premorbidly (Beumont et al., 1976; Garfinkel et al. 1980), and in fact, may be of average weight or above during their illness, thus amenorrhea is less frequent in these patients (Russell, 1979). They have been described as experiencing more anxiety, guilt, depression and sleep disturbances, and at the same time, are more outgoing (Casper et al., 1980). A side effect of vomiting, disturbed serum potassium levels, complicates the picture further for bulimics (Russell, 1979).

In 1972, Feighner, Robins, Guze, Woodruff, Winokur and Munos examined clinical reports, laboratory research, follow-up and family studies and derived criteria for several sufficiently validated psychiatric illnesses, including anorexia nervosa. Their criteria have been employed by many researchers in the field, sometimes with slight modifications (e.g. Garfinkel et al., 1980), and are as follows:

> A. Age of onset prior to 25.
> B. Anorexia with accompanying weight loss of at least 25% of original body weight.
> C. A distorted, implacable attitude towards eating, food, or weight that overrides hunger, admonitions, reassurance and threats; e.g. (1) denial of illness with

a failure to recognize nutritional needs, (2) apparent enjoyment in losing weight with overt manifestation that food refusal is a pleasurable indulgence, (3) a desired body image of extreme thinness with overt evidence that it is rewarding to the patient to achieve and maintain this state, and (4) unusual hoarding or handling of food.
D. No known medical illness that could account for the anorexia and weight loss.
E. No other known psychiatric disorder with particular reference to primary affective disorder, schizophrenia, obsessive-compulsive and phobic neurosis. (The assumption is made that even though it may appear phobic or obsessional, food refusal alone is not sufficient to qualify for obsessive-compulsive or phobic disease.)
F. At least two of the following manifestations. (1) Amenorrhea (2) Lanuga (3) Bradycardia (persistent resting pulse of 60 or less) (4) Periods of overactivity (5) Episodes of bulimia (6) Vomiting (may be self-imposed) (p. 61).

In addition to the symptom complex just described, there are numerous changes which occur due to starvation, and can be called secondary symptoms. These include low blood pressure, slow pulse, low basal metabolism rate, hypothermia, anemia, sleep disturbances, and accompanying neuroendocrinological disturbances and gastrointestinal symptoms (Bruch, 1978; Russell, 1967; Sours, 1973). As noted, electrolyte disturbances are common in those who vomit or use purgatives to lose weight. The Feighner et al. criteria include binge eating and vomiting as two possible manifestations of anorexia, but still under the diagnostic umbrella of anorexia.

The Diagnostic and Statistical Manual of the American Psychiatric Association, Second Edition (DSM-II, A.P.A., 1968) did not recognize anorexia nervosa as a separate diagnostic entity. It could be diagnosed under "feeding disturbances", a subcategory of Section VII "Special Symptoms" not elsewhere

classified. In short, very little attention was given to the disorder. DSM I (A.P.A., 1952) had listed anorexia as an example of psychophysiologic gastrointestinal reaction.

DSM III (A.P.A., 1980) lists anorexia nervosa under "Disorders Usually First Evident in Infancy, Childhood, or Adolescence", along with other eating disorders such as bulimia or pica. The diagnostic criteria include:

> A. Intense fear of becoming obese, which does not diminish as weight loss progresses.
> B. Disturbance of body image, e.g. claiming to "feel fat" even when emaciated.
> C. Weight loss of at least 25% of original body weight, or if under 18 years of age, weight loss from original body weight plus projected weight gain expected from growth charts may be combined to make the 25%.
> D. Refusal to maintain body weight over a minimal normal weight for age and height.
> E. No known physical illness that would account for the weight loss.(p.69)

Although included with disorders first evident in adolescence, DSM III notes that age of onset can range from prepuberty to the early 30s. Associated features are mentioned, which have already been discussed, such as binge eating, vomiting, food obsessions, amenorrhea, and other physical symptoms.

Bulimia is considered in DSM III as a separate diagnostic category, not due to anorexia nervosa. It is comprised of episodic binge eating accompanied by weight fluctuations, restrictive diets, vomiting, and use of cathartics and diuretics. The patient is aware of her abnormal eating pattern, and fearful of not being able to control it. The binge episodes are followed by depressed mood and self-deprecating thoughts.

Bulimia is differentiated from anorexia nervosa by less extreme weight fluctuations which are not life-threatening. The precipitating problem with both disorders seems to be fear of becoming fat. There is a preoccupation with food, weight and body image in both illnesses, with accompanying mood disturbances (Schlesier-Stropp, 1984). The clinical presentation, complicating factors and prognosis differ to an extent that they cannot be considered identical disorders. Thus, the current study will adopt the aproach of Russell (1979) in considering bulimia nervosa a variant of anorexia nervosa, and will separate the two diagnostic groups, which will henceforth be referred to as restricters and bulimics. The term 'anorexics' will be used to refer to both anorexia and bullimia nervosa, as the distinction between restricters and vomiters has not always been made in the literature.

III. Family Factors in Anorexia Nervosa

A number of factors relating to family background or dynamics have been hypothesized as contributing factors to anorexia nervosa. Garfinkel and Garner (1982) suggested that the role of the family may interact with individual factors in predisposing certain individuals to the disorder. The main difficulty with research on this issue is in distinguishing predisposing or causal phenomena from the results of dealing with such an illness in the family over an extended period of time. Since most family studies have been restrospective, results can only be seen as suggestive, with longitudinal studies with high risk populations a goal for the future.

Until recently, social class was thought to be a factor in anorexia nervosa, with a greater incidence in middle or upper class families (Crisp, Palmer & Kalucy, 1976). This may have been due to a differential emphasis in these families on values and attitudes regarding body weight or achievement (Garfinkel & Garner, 1982). More recently, possibly reflecting a more wide-spread adherence to such values, anorexia appears to be more equally distributed among social classes (Theander, 1970).

The familial contribution to anorexia nervosa has been examined in terms of a genetic component. Because of the difficulty in separating genetic from environmental factors, and the low incidence of the disorder, no conclusions can yet be

drawn. Twin studies, reviewed in Garfinkel and Garner (1982) are rare, but suggest a higher concordance for monozygotic versus dizygotic twins.

Some authors have suggested that there is a higher degree of general pathology or conflict in the families of anorexics (Kalucy, Crisp & Harding, 1977) Marital separations and ongoing conflict were noted more frequently in families of anorectics compared with controls by Kay, Schapira and Brandon (1967), while disturbed family relations or disharmony were found to be related to outcome in a follow-up study conducted by Morgan and Russell (1975); this study did not include a control group.

Early reports suggested that a pattern of dominant mother/ weak father was typical in the background of anorexics, but this has not been confirmed. Dally and Gomez (1979) found no one predominant pattern of personalities or relationships among patients' families. They noted, however, a considerable degree of disharmony, greater in families of younger patients, but again the timing of such conflict cannot be determined. It has been suggested, with some support from a study by Crisp, Harding and McGuinness (1974) that parental psychopathology, particularly maternal depression and anxiety, increase after the anorexic patient gains weight, implying a protective influence of the illness for the parents.

Dally and Gomez also described the "special prominence" food was given in the families of 25% of their patients (e.g. vegetarian or health-food diets), and overconcern with the

child's diet, or unusual food fads or preoccupations in family members. Although conflict over feeding often existed from infancy, in their sample, such feeding difficulties occur in 50% of children.

In examining family influences in anorexia nervosa, it is important to consider the role of the family in conveying cultural values and beliefs about weight, achievement concerns, self control and appearance. Kalucy et al. (1977) and Garfinkel and Garner (1982) reported other food or weight concerns in the families of anorexics; e.g. weight fluctuations, underweight, obesity, a preoccupation with food, or an overconcern with exercise and self-control. The anorexic's concern with performance, perfection, and appearance have been cited in a number of clinial reports (Dally, 1969).

In conjunction with this parental conveyance of weight and achievement related attitudes, recent systems approaches to studying family interactions have noted a certain overprotectiveness or overinvolvement in families of anorexics. The patient's psychological and physiological well-being becomes the family's main focus of concern, resulting in interpersonal and intrapersonal conflict around autonomy, competence and self control (Minuchin, Rosman & Barker, 1978). Bruch (1973) and Selvini Palazzoli (1974) have pointed to these conflicts as possible sources of the anorexic's feelings of ineffectiveness and body image disturbances. A predominance of self control concerns in anorexia and bulimia has been noted previously.

Heron and Lehup (1984), in a study of families of anorexics, found that they were more likely to have perfectionist traits, and to report that their family relationships were happy, and very close. As with other factors, it is impossible to determine, as yet, whether such patterns serve as predisposing or maintaining factors in the illness, or in what way they may interact with individual variables.

IV. Anorexia Nervosa and Depression

It has been noted by several researchers that there may be a relationship between anorexia nervosa and affective illness. One recent 5-year follow-up of 26 patients hospitalized for anorexia in adolescence found only one patient still possibly anorexic, although other eating problems were evident, e.g. obesity, food fads, compulsive eating (Cantwell, Sturzenburger, Burroughs, Salkin & Green, 1977). Using diagnoses based on parent and patient reports, it was found that a high percentage of patients manifested depressive symptomatology, both pre- and post-morbidly; this was even greater at the time of follow-up. The most common symptoms were dysphoric mood, vegetative symptoms, suicidal ideation and feelings of worthlessness. There were several certain or probable diagnoses of affective disorder. Further, there was a higher than expected family history of affective disorders, especially among the mothers of these patients. Other studies have reported a high incidence of depressive symptomatology in anorexia patients, either initially or on follow-up (Dally, 1969; Kay & Leigh, 1954; Morgan & Russell, 1975; Theander, 1970).

In considering these findings, it is possible to take the view that, in accordance with most diagnostic criteria (Dally & Gomez, 1979; Feighner et al., 1972), a diagnosis of anorexia nervosa is incorrect if other symptoms are primary. However, it

may be difficult to determine in some cases what is primary, and the diagnosis becomes equivocal (Crisp, Hsu, Harding & Hartshorn, 1980). On the other hand, it may be, as Cantwell et al. suggested, that some cases of anorexia are a variant of affective disorder.

A recent family history study found a risk for affective disorder in relatives of patients with anorexia and bulimia similar to that found in families of bipolar disorder patients. On finding a higher prevalence of affective disorder in families of anorectic patients, Hudson, Pope, Jonas & Yurgelun-Todd (1983) note that environmental causes (distress generated by coping with illness in the family) cannot be discounted in favor of genetic explanations. The risk in families of eating disorder patients was, however, greater than that for families of patients with schizophrenia or borderline personality disorder.

There does appear to be a consensus that anorexic patients frequently manifest depressive symptoms. The vegetative symptoms usually associated with depression, such as changes in appetite, and weight loss or gain, may become central to the adolescent female who is already concerned with issues of body image, and a vicious cycle may ensue: body image doubts, low self-esteem, loss of appetite, more focus on body image, etc. (Cantwell et al., 1977; Fairburn & Cooper, 1984). This does not necessarily assume, however, that anorexia is a variant of affective illness, or as some have suggested, that they can be equated. Moreover, the so-called "vegetative signs" all occur in

starvation, so that such signs may be a complication of their poor nutritional status (Casper & Davis, 1977; Strober, 1980). Another possible explanation is that some of the underlying mechanisms may be similar in the two disorders. For example, feelings of helplessness have been cited as an etiological factor in depression (Seligman, 1973), whereas a sense of ineffectiveness is thought to be central in the genesis of anorexia nervosa (Bruch, 1973).

It is possible that similar genetic or other predisposing factors may be behind the higher prevalence of major affective disorder in families of anorectics and bulimics, with the final pathological outcome depending on other predisposing or precipitating factors, such as individual differences.

V. Anorexia Nervosa and Other Eating Disorders

Several researchers have drawn parallels between the underlying psychological and behavioral components of anorexia and obesity (Bruch, 1973; Garner, Garfinkel, Stancer & Moldofsky, 1976; Orbach, 1978). Orbach (1978) described obesity as an eating compulsion out of control, and anorexia as an eating compulsion under control. This compulsion is characterized by a disconnection between eating and physiological indicators of hunger, feelings or fears of being out of control around food, and self-recriminations about this and about one's body. A great deal of energy is devoted to thinking and worrying about food and weight, for example, scouring magazines for diet information. Orbach discusses both disorders as, in part, a rejection of societal pressures to be slim, feminine, and sexy, by refusing to adopt the norm altogether, or by exaggerating, and thus, ultimately rejecting it.

Support for the obesity-anorexia connection comes from the finding that anorexics are often obese premorbidly (Crisp et al., 1980). Similarities have been shown between the two groups in terms of body image distortions, perceptual disturbances, and reactions to internal (physiological) versus external (cognitive or emotional) cues about eating and body weight (Garner et al., 1976; Russell, Campbell & Slade, 1975; Silverstone & Russell,

1967).

Crisp (1967) sees anorexia as a weight phobia, in contrast to a feeding disorder, and emphasizes the importance of the relationship between weight increase and psychosexual maturation, and adolescent/ mother issues such as independence. Accordingly, this weight phobia takes the form of fear even of normal post-pubertal weight. Crisp draws parallels between the addictive/impulsive aspect of the behavior of anorectic and obese patients in relation to food. This is particularly evident in bulimia nervosa, where the binge-purge cycle has a particularly addictive quality.

Perhaps the only difference between obese and bulimic patients is that bulimics have learned to vomit to eliminate calories. This was proposed by Beumont (1977) who found bulimics often had a history of obesity.

VI. Body Image and Body Awareness

Body Image

Perceptual disturbances common in anorexia nervosa are commonly reported in the areas of visceral sensations, emotional responses, and body image (Bruch, 1973). Body image is thought to encompass an individual's feelings and thoughts about, and mental image of, her body, and is not always consistent with objective reality, as seen in the phantom limb phenomenon (Kolb, 1975). This has also been demonstrated by clinical and research reports of anorexia patients who are not only unconcerned with their extreme thinness, but indeed actively pursue it as an ideal state, and deny their emaciation.

As with some other features of anorexia nervosa, it is not known whether body image disturbances are a determinant or a byproduct of the illness (Askevold, 1975; Slade & Russell, 1973). Strober et al. (1979) see problems in body image formation as primary, rendering anorexics "vulnerable to their manifest pathology, which is itself activated by maturational conflicts unique to adolescence" (p. 696). Similarly, there is some disagreement as to whether a disturbance in body image is stable over time or whether it improves concurrently with or as a result of weight gain. Bruch (1973, p. 90) considers a

realistic body image to be a prerequisite for recovery, and feels that the basis for body image and affective and visceral misperceptions is an overall sense of ineffectiveness, which must be addressed in psychotherapy. Bruch describes anorexic patients as not feeling "...in control of their behavior, needs, and impulses, as not owning their bodies, as not having a center of gravity within themselves."(p. 55). Similarly, Boskind-Lodahl (1976) noted that an anorexic's "distorted body image was linked to a complete lack of confidence in her own ability to control her behavior" (p. 348).

Methods of examining body image experimentally have included distorting mirror (Traub & Orbach, 1964) and photograph (Glucksman & Hirsch, 1969) techniques, a caliper device, the Image Marking Procedure (Askevold, 1975) or visual size estimation apparatus (Garner, Garfinkel, Stancer & Moldofsky, 1976), and self-report or projective measures (Stunkard & Mendelson, 1967). Initial studies (e.g. Slade & Russell, 1973) found that anorexics tended to overestimate their body size, whereas normals did not; that weight gain led to greater accuracy; and that degree of overestimation was related to poor prognosis.

Data from recent studies is much more equivocal and complex. Using a visual size estimation apparatus, Button, Fransella and Slade (1977) and Crisp and Kalucy (1974) found that anorexics and normal females did not differ in the degree of overestimation of body parts (face, chest, waist, hips and

stomach depth). Button et al. found no greater accuracy in the anorexic group after weight gain, and found that vomiters differed significantly from non-vomiters, in that they overestimated more. Crisp and Kalucy noted that an improvement in body size estimation was associated with good outcome. Interestingly, Button et al. also found a significant correlation between proportion of weight gain in the first few days of hospitalization and body perception indices. They suggest this may be a function of extremely low level of pre-hospitalization food intake, combined with oversensitivity to undesired body changes and anxiety about initial weight gain, even in small amounts.

While Strober et al. (1979) found more overestimation of body size in anorexics than in controls, the difference was not significant. However, anorexics reported significantly more feelings of estrangement from the body, insensitivity to body sensations, and poor body boundaries. These differences remained into the post acute phase of illness, and along with more severe distortions, were associated with vomiting or bulimia. These findings are consistent with other reports of a relationship between bulimia, degree of overestimation of body size, severity of weight phobia, denial of illness, level of maladjustment, and lowered threshold of sensitivity to body changes (Button, Fransella & Slade, 1977; Casper, Eckert, Halmi, Goldberg & Davis, 1980; Garfinkel, Moldofsky & Garner, 1979; Slade, 1977; Slade & Russell, 1973).

A seeming contradiction in the above findings is, on the one hand, insensitivity to body sensations (Strober et al., 1979), and on the other, lowered threshold of sensitivity to undesired body changes (Button et al., 1977). In the former study, "insensitivity to body sensations" is used to describe a perception of blockage of body openings on the Fisher Body Distortion Questionnaire. In general, the anorexic's recognition of bodily sensations is probably inaccurate, possibly taking the form of insensitivity to certain aspects, and oversensitivity to others, especially weight gain.

Russell, Campbell & Slade (1975) examined anorexics' reactions to external information about body weight. Over a period of 30 days, anorexics were given false information about their weight. For the first 15 days, the body weight given was progressively underestimated; during this period, anorexics responded with weight gain. For the next 15 days, as the weight information was slowly returned to accuracy, anorexics responded with weight loss. The weight of the normal control subjects remained steady. This supports the notion that anorexics are more susceptible than normals to external weight or body image information. This study did not differentiate bulimics from restrictors.

Strober et al. suggest that patients with more serious perceptual difficulties, less accurate subjective awareness of body sensations and boundaries, and less sense of personal control over their bodies are more likely to binge and vomit in

order to attain some control over bodily functioning.

A study using both a distorting photograph technique and a visual size estimation apparatus to measure body image found that both obese and anorexic subjects differed from control groups on the former (general) measure, but not on the latter, a measure of specific body regions (Garner, Garfinkel, Stancer & Moldofsky, 1976). Obese and anorexic subjects did not differ. Only one-half of each of these groups overestimated, while the other half were more similar to control subjects, suggesting two distinct patient subgroups. Garner et al. related these findings to various personality measures, and found anorexics to be more introverted than the other groups. This concurs with the findings of Smart, Beumont and George (1976) who reported higher neuroticism, anxiety and independence scores, with more introversion and obsessional features in anorexics, as compared with normals.

Examining the differences between over and under-estimators, Garner et al. (1976) found that degree of neuroticism on the Eysenck Personality Inventory and degree of lack of self-control on the locus of control scale (a sub-scale on the Rotter I-E scale dealing with control over impulses, desires and emotions) were positively related to overestimation in anorexics. For obese subjects, total I-E scores were related to overestimation. It is suggested that their overt self-control is a defense against pervasive feelings of ineffectiveness. The question arises of whether the overestimator group contained

more bulimic patients. Other studies have reported that bulimia is related to greater overestimation, more pathology and poorer prognosis (Button, Fransella & Slade, 1977; Freeman, Thomas, Solyom & Miles, 1983).

Research on perceptual disturbances in the obese has related body image to self esteem and mood. Stunkard and Mendelson (1967) described a circular relationship between body image disturbances, esteem-lowering experiences and depressed mood. They believe, however, that once a distortion in body image becomes established in the obese, weight loss alone will not reverse it. They found three factors which predisposed obese individuals to the development of a distorted body image; these were onset of obesity during childhood or adolescence, presence of emotional disturbances (not sufficient alone), and negative feedback about their obesity from others. Extrapolating from these findings to anorexia nervosa, onset of the disorder is typically during childhood or adolescence, emotional disturbances are present (e.g. family or intrapersonal conflict), and there is usually considerable censure and pressure from parents and professionals to eat normally and gain weight. Also, clinical reports often cite a negative remark about body size or weight by a parent or friend as a precipitator of the disorder. In a further study, Stunkard and Burt (1967) reported that formerly obese individuals who experienced body image problems differed from those who did not in that they lost weight during late adolescence for cosmetic

reasons (as opposed to naturally, or for health reasons), in response to external pressure and teasing about their obesity. Even at normal weight, these individuals were unduly sensitive to and preoccupied with their physical appearance. The derogatory views and comments of parents and friends had apparently been incorporated into their stable self-image. Crisp and Kalucy (1974) believe that previous weight and shape perceptions, even for individuals of normal weight, may be "imprinted" in the memory, in both a physiological (cellular) and experiential sense.

A recent study has demonstrated the same stability in visual self-perception and interoceptive disturbances in anorexics (Garfinkel, Moldofsky & Garner, 1979). Using a distorting photograph technique and a sucrose satiety aversion test, Garfinkel et al. found that body size overestimation and absence of (normal) aversion to sucrose satiety remained after weight change, one year after initial testing.

Body Awareness

It has been suggested that misperceptions of hunger, satiety, fatigue and sexual feelings are related to disturbances in body image (Bruch, 1973). Obese and anorexic subjects have been reported as less accurate than normal weight subjects in perceiving or labelling hunger and other sensations. (Coddington & Bruch, 1970). Garfinkel (1974) found that, while anorexics and

normals did not differ in their physiological perceptions of hunger, their perceptions of fullness or satiety were quite different. This may account for their claims of feeling bloated after eating a small amount, and their fear of being unable to stop if they eat so much as one bite of food. In conjunction with sensations of hunger, anorexics were more likely to report negative mood states (tension, irritability, depression), strong (vs. no, mild or moderate) urges to eat, and preoccupation with thoughts of food. They did not differ on various gastric, mouth and throat, or general physical sensations; both groups perceived hunger as a sense of gastric emptiness. On satiety, anorexics experienced either no gastric sensations or bloating rather than fullness, more frequently still experienced a negative mood state, and although not statistically significant, were more likely to report continuing preoccupation with thoughts of food (Garfinkel, 1974). As noted above, anorexics do not experience an aversion to sucrose satiety, also suggesting that they are less responsive to internal satiety cues, or that such cues become misinterpreted cognitively (Garfinkel, Moldofsky & Garner, 1979).

Garfinkel et al. suggest that one treatment goal for anorexics may be to provide the patient with a cognitive set for acceptance of bodily misperceptions, to encourage the patient's acceptance of her body regardless of how she perceives it. Freeman et al.(1984)reported that dissatisfaction with body image was the most potent predictor of relapse in patients with

bulimia nervosa. Similarly , Fransella and Crisp (1979) described a patient who finally maintained her weight gain, only after beginning to attach less importance to normal body weight. Using a repertory grid technique, they found quite different conceptualizations of weight in normals and anorexics, whereas the constructs used by normal and neurotic women did not differ. For anorexics, being fatter than they were, being sexually attractive, ideal self and ideal weight, formed a cluster, which offers support for the view that anorexia is a way of avoiding sexual maturity. Fransella and Crisp offered several explanations for the unexpected positive correlation between self at normal weight and ideal weight: it may have been a chance finding, the patients may have been lying, they may have persuaded themselves of its truth, or they may have been subscribing to the "if only" hypothesis (allowing them to maintain the status quo). Another explanation might be that there is a difference in how these constructs are utilized by dieters and bulimics. These subgroups were not discussed in the report, but it might be that dieters, with a somewhat more positive prognosis, less resistance, and less body image distortion, were at some level aware of the validity of the normal/ideal weight concurrence. In other words, the underlying cognitions and perceptions of dieters may be more realistic or less subject to distortion at the outset. Fransella (1970) discussed the a relationship between conceptual rigidity and poor outcome in the obese. They suggest that greater conceptual

flexibility may allow for more potential ability to reconstrue one's self as normal weight, thus improving the prognosis. The same relationship may hold for anorexics.

Fransella and Crisp (1970) also considered the temporal relationship between attitudes or self-construal and body image and weight change. They examined attitudes to self and others in two obese women during weight change, using a repertory grid technique. They found that evaluation of the self was highly polarized, from "bad" to "good" during weight loss, then back to "bad" during weight gain. These changes in self-construal occurred prior to regaining weight, providing further support for the view that cognitive changes are essential if meaningful and long-lasting behavioral changes are to occur in weight disordered patients. Similarly, Stunkard and Mendelson described an obese man who saw himself in the mirror as fat, yet reported, "I feel thin" (p. 1298). He went on to lose 140 lbs., which was maintained at a 5 year follow-up.

In conclusion, it seems that body size overestimation is not exclusive to anorexics, but occurs in obese and even normal weight and pregnant females (Button, Fransella & Slade, 1977; Crisp & Kalucy, 1974; Slade, 1977; Stunkard & Mendelson, 1967). From the foregoing review, it appears there is a relationship between degree of body image disturbance and denial of illness, bulimia and poor prognosis. It is unclear whether an increase in accuracy is associated with an increase in weight (Slade & Russell, 1973), or unrelated to weight gain (Button et al.,

1977). Supporting this relationship, a recent study reported a correlation between greater accuracy of body size estimate and actual width of body parts (Ben-Tovim, Whitehead & Crisp, 1979). This lack of accuracy at lower weights and body widths may be a contributor to the maintenance of anorexia. Actual changes in body size are misperceived as weight loss occurs; thus, dieting continues. Further, the mental image or internal representation may take some time to alter, following significant weight gain or loss.

A number of issues remain unresolved in body awareness research. The relationship between body image, other aspects of body awareness such as perception of physiological and affective sensations and personality variables remains unclear. The relationship of these variables to self control and what Bruch has termed the anorexic's overall sense of ineffectiveness requires further elucidation. Finaly, the role of body image in the genesis, course and treatment of anorexia warrants further examination.

Restraint in Eating Disorders

A promising attempt to explore cognitive versus physiological factors in the perception of phsyiological or affective stimuli has led to the development of the construct of restraint. This concept stems from research examining the effect of internal versus external cues on satiety and food intake in obese and normal weight subects (Schacter, 1971; Wooley, 1972). This research and its relevance to anorexia nervosa will be reviewed.

While food consumption is typically under the control of internal, physiological cues, obese individuals were thought to be more responsive to external cues, such as time of day or salience of food cues. In addition, Nisbett (1972) noted that the obese consumed food either in very small or very large quantities, rather than moderate amounts. He suggested that both normal and obese individual eat to bring their weight to some biological set-point, a function of the number of fat cells in the body. Dieting, frequently practiced by the obese, would keep the individual constantly below her setpoint (ideal weight), therefore her fat cells (adipose tissue) would be relatively depleted. Individual differences in the number of fat cells would then account for individual differences in eating behavior in normal and overweight eaters. The interaction between number of fat cells, and response to internal or external cues, would

determine an individual's weight, how close it is to set-point, and her eating patterns. Being constantly far below set-point will make an individual more susceptible to external controls. Individual differences in eating behavior would then be expected independent of actual weight.

Wooley (1972) found that both low and high calorie "preload" drinks which appeared to be high calorie led to a greater experience of fullness and to less food intake at a subsequent experimental meal of sandwiches. While it was thought that normal subjects might be superior to the obese in caloric regulation, there were, in fact, no differences between the two groups. Wooley also found that subjects ate a large amount after the preload, and were inaccurate (low) in their estimates of this amount. She felt this was because the sandwiches were cut in quarters, so that subjects were unable to cognitively monitor the amount, resulting in a failure of intake regulation.

Most individuals "restrain" their eating behavior in response to social situations and the cultural ideal of thinness (Garner, Garfinkel, Schwartz & Thompson, 1980). In consideration of this phenomenon, and furthering the research on internal and external cues, Herman and Mack (1975) coined the term, restraint. In their initial study, they examined the consequences of experimentaly "removing" restraint. They expected that typically highly restrained eaters (e.g. chronic dieters) would be more responsive to external cues and eat more ice cream once their restraint had been removed by a preload

milkshake (amounting to a physiological or cognitive release of appetite control). Unrestrained eaters would still respond to internal cues, their appetites inhibited by the preload, and eat less ice cream. This was in fact what they found, with no differences between obese and normal weight subjects. Herman and Mack derived their "Restraint" scale from this study. Restrained eaters are defined as those who monitor and carefully control their weight and food consumption, whereas unrestrained eaters are those who seldom pay any attention to food consumption or weight. The Restraint scale is composed of items dealing with attitudes to dieting, weight, concern with food and eating, and weight history.

Low restraint subjects are those typically thought to be "normal", i.e. guided by internal regulation of food intake, whereas high restraint subjects react to external cues, especially once restraint is removed. Eating behavior in the Herman and Mack study seemed to be determined by degree of deprivation in relation to set-point, rather than degree of overweight. The concept of restraint has received some construct validation, in that it is significantly correlated with free fatty acid level (an index of food deprivation) after a fasting period, in obese and normal subjects (Hibscher, 1974; cited in Herman & Polivy, 1975).

It should be noted here that the internal-external distinction as a framework for explaining obesity has been questioned recently (Rodin, 1981). Indeed, in her review of this

area, Rodin concludes that there is no empirical support for such an extreme polarization on this dimension. External cues may influence internal physiological states, and vice versa, internal cues may influence external cue salience or responsivity. For the purposes of the current research, it is accepted that the two interact in complex ways, as Rodin suggested.

Recent research on the restraint dimension has attempted to clarify the initial findings. In addition to external cues, it has been hypothesized that the obese and/or restrained eater may respond to negative affective stimuli, e.g. anxiety, with eating, if attractive food is made available. This was supported by McKenna (1972) who, conversely, found that anxiety inhibited normals' eating. When Herman and Polivy (1975) conducted a similar study, they confirmed McKenna's results. After an anxiety manipulation (anticipation of painful electric shock), unrestrained eaters ate significantly less, whereas restrained eaters ate more. While anxiety was found to facilitate eating, this behavior did not in turn decrease anxiety levels, as McKenna had predicted. In their conclusion, Herman and Polivy described anxiety as a "disruptor of behaviors" (including self-control behaviors) (p. 672). Similarly, Polivy and Herman (1976) recently reported that clinically depressed subjects classified as restrained gained weight during their depression, whereas unrestrained subjects lost weight, suggesting a relationship between emotionality and eating. Slochower (1976)

also found that obese subjects ate more when they could not identify or label a state of high arousal (false heart rate feedback), in constrast to normal weight subjects, who ate less. Obese subjects did not eat more when the rapid heart rate feedback was explained as a result of noisy conditions in the lab. Slochower, unlike Herman and Polivy, found that obese subjects experienced significant affect reduction following eating. In general, obese subjects were more responsive to the experimental manipulation (i.e. to external cues), while normal weight subjects ate as a function of their own arousal and level of hunger (this study did not employ the concept of restraint). Slochower suggests that the obese individual may identify various internal or emotional sensations as a cue for eating, perhaps a response learned in childood (the psychosomatic hypothesis of overeating; Kaplan & Kaplan, 1957). The result of responding to distress in a child with food may be a general inability to correctly differentiate emotional states and hunger sensations. Further, even when aware of her eating response to arousal, the obese individual may continue to overeat, having learned its stress reducing properties. Further experimental support for the notion of greater emotional resonsiveness in the obese is derived from a study reporting more extreme ratings of positive and negative affective stimuli by obese males than normal weight males (Pliner, Meyer & Blackstein, 1974).

In view of the relationship between obesity and emotional or external cue responsiveness, and the previously noted

similarities between obese and restrained eaters, one would predict the same hyperresponsiveness in normal weight restrained eaters, the common factor being dieting behavior in both groups. Indeed, a recent study found that dieters were more extreme emotional responders, as were the obese in the above study (Polivy, Herman & Warsh, 1978). Caffeine-induced arousal reduced the emotional responsiveness of restrained subjects and increased the resonsiveness of unrestrained subjects. Polivy et al. discussed their findings in terms of the relationship between internal arousal and external stimuli. This study reiterated the importance of the links among emotions, arousal level, eating and weight control.

Examining the similarities between the obese and restrained eater, and the "normal" and unrestrained eater, Hibscher and Herman (1977) hypothesized that dieting, rather than obesity, would be the best predictor of so-called "obese" characteristics. Using the original restraint paradigm, subjects were given a milkshake preload, then an "ice cream taste test". As expected, an interaction was found between size of preload and dieting status. Similarly, restraint, rather than weight per se, was associated with level of free fatty acids. This study also looked at a group of underweight subjects. The underweight subjects were similar in behavior to obese subjects, but again, restraint was the better predictor. Also, it would appear that underweight was poorly defined in the study, with normal weight being defined as 0 - 14% over matched population mean weight,

and underweight anything below that. In regard to the findings concerning FFA levels, which may, at times, result from stress or arousal, the authors postulate that food deprivation may, itself, be a source of stress. Regardless, the phenomenon is found in dieters and, it would seem, only artifactually in the obese (i.e., secondary to restraint).

Cognitive monitoring and stimulus salience were studied by Collins (1978) who found that restrained eaters who were asked to monitor their intake ate more M&Ms when asked to rate food pictures than when asked to rate scenery pictures. The food cue was thought to act as an external stimulus which encouraged them to eat more. Other studies have found that thinking about food increased obese subjects' tendency to eat (Ross, 1970; cited in Pliner, 1973; Tom & Rucker, 1975). Such cues, whether external (e.g. pictures or the sight of food) or internal (e.g. self statements, fantasies) may result in a kind of "cognitive breakdown" of restraint, as the preload milkshake (Herman & Mack, 1975; Hibscher & Herman, 1977) resulted in an actual breakdown of restraint. This brings to mind the often heard complaint or fear of the anorectic individual: "I'm afraid that if I have just one bite, I'll gain weight, or won't be able to stop". Further, it is likely that thinking about food and eating brings about certain physiological responses, e.g. symptoms of anxiety. This physiological arousal may then be responded to, like anxiety, with eating, creating a vicious circle. It is conceivable that cognitions related to food and eating, such as

negative thoughts about weight or body image, which also provoke anxiety, may result in a similar cognitive breakdown of restraint.

It has been suggested by others (Herman & Polivy, 1975; Slochower, 1976) that stress or anxiety interferes with self-control. Herman, Polivy, Pliner and Threlkeld (1978) related cognitive externality to elevated arousal levels, and disinhibition of suppressed eating. In relation to this, Polivy and Herman (1976) found that alcohol disinhibited restraint in dieters, but only when they were aware they had consumed alcohol, illustrating the importance of cognitive labelling. This is similar to the cognitive effect of an apparently high calorie drink on eating.

Conversely, a further study looked at the conditions which might encourage the retention of self-control or restraint (Herman & Polivy, 1979). The manipulation used to encourage self-control was the simple presence of an observer. Observed restrained eaters ate less than unrestrained eaters following a large preload, but ate more, like the unrestrained eaters, following a small preload. In other words, the presence of the observer caused subjects to behave similarly to unrestrained, normal eaters. When the observer was removed, restrained eaters returned to their counterregulatory pattern. The external factor (the observer) was the factor accounting for their initial "sensible" eating. The removal of the observer may also have had some affective consequences for restrained eaters, i.e. they may

have felt 'sneaky', thus increasing their anxiety.

A related study examining the effect of a model on eating behavior found that restrained eaters ate less; the model's consumption was directly related to amount eaten; and subjects who observed a "dieting" model consumed less (Polivy, Herman, Younger & Erskine, 1979). When exposed to a nondieting model, restrained eaters (who initially maintained restraint) were more likely to overeat nuts in the second part of the experiment. This was found to be associated with inaccurate monitoring of intake. Since restrained subjects in the dieter-model condition were more accurate in their consumption estimate, it was hypothesized that a cognitive event triggered counterregulation (bingeing) in the non-dieter condition. One possibility is that anxiety increased in restrained eaters who knew they were being observed by a non-dieting, unrestrained eater. (Both models ate 8 quarter sandwiches; they simply identified themselves differently). Again, this study emphasizes the importance of cognitive monitoring, and its effect on overt behavior.

Spencer and Fremouw (1979) in a study similar to Wooley's 1972 experiment, found that restrained subjects ate more ice cream after consuming a drink described as high calorie, than after a drink described as low calorie, although in fact the caloric content of the drinks was the same. This held true regardless of actual weight classification. It provides further support for the notion that binge eating results from breakdown of restraint, and that belief about caloric intake is one

determining factor. Like Polivy and her colleagues, these authors suggest that cognitive restructuring strategies are crucial to weight control programs, especially when binge eating is a problem.

In regard to restraint and set-point, it seems that anorectic patients, at least behaviorally, should be highly restrained, while probably far below their biological set-point. A study by Polivy (1978) reported that anorexics scored significantly higher than normals on the restraint scale, with bulimics higher than dieters. Polivy examined this result in more detail, and identified what she called motivation to diet and to eat. She found that both dieters and bingers felt an intrinsic motivation to diet, but that in addition, bingers felt an external motivation, i.e. they felt forced to diet. On the whole, both groups felt less intrinsic motivation to eat than normals, with the least internal motivation to eat in bingers. Extrinsic motivation to eat was higher than in normals for both groups, and highest in the dieters. Bingers especially then, feel forced to eat and forced to diet. Anorexics have apparently lost, not the experience of hunger, but the intrinsic desire to eat. Although this pattern may appears confusing and needs further elaboration, it must be even more confusing to the individual experiencing such conflicting motives.

As outlined previously, some writers have discussed the relationship between anorexia and depressive illness, and the prevalence of depressive symptomatology in anorexia. The

oft-described symptoms of appetite and weight loss are manifested in both disorders. It is unclear what form the connection takes, but one study noted that depressed mood increased in hospitalized anorexics when weight decreased (Amdur, Tucker, Detre & Markhus, 1969). Weight increase, then, may be associated with general symptom exacerbation, which is paradoxical given the anorexic's overvaluation of weight loss. A recent study examining restraint, clinical depression, and weight change may have relevance for anorexia and weight change. Polivy and Herman (1976) reported that depressed patients classified as restrained gained weight in conjunction with their depression, whereas unrestrained patients lost weight. It may be hypothesized that restrained eaters experience feelings of loss of control with depression, which would lead to overeating. One might speculate that the same phenomenon occurs in anorexics who binge, and that restricters, who are somewhat less restrained (Polivy, 1978) would be able to maintain control and lose weight (as found by Amdur et al., 1969; these authors did not discuss bulimics).

It is not known whether a temporal or causal relationship exists between loss of control (breakdown of restraint), depressed mood, and weight change, but it appears that they are correlated. Polivy and Herman suggest that the anxiety component of depression may be a factor in disrupting self-control behavior. They concluded that "weight changes bear a complex but systematic relation to emotional distress and well-being" (p.

338). Clearly cognitive, social and emotional factors play an important role in eating behavior. From the above review, it might be concluded that for some individuals food, eating, and related cognitions and behaviors are affect-laden. This may be partly related to cultural norms of health, figure and fashion, to early learning experiences within the family related to meal times and food, and past or present pressure and criticism from family and peers to achieve weight change (whether loss or gain). In view of these complex interactions, it becomes evident that decisions concerning food intake and body size may have "implications for perception and self-perception of 'character'" (Herman & Kozlowski, 1979). Control over eating may, in some cases, become the central component of self-esteem.

VII. Social Factors in Anorexia Nervosa

Sociocultural factors may exacerbate the anorexic's manifest pathology. According to the results of a recent study of magazine centerfolds and Miss America contestants in recent years, there is good reason to believe that standards of beauty in our culture are moving toward a thinner "ideal woman" (Garner, Garfinkel, Schwartz & Thompson, 1980). This is in spite of the contradictory finding that average weights for women have increased somewhat in recent years, according to recent Metropolitan Life Insurance Company actuarial figures. These authors and others have suggested that such unrealistic standards may be linked to an increasing incidence of anorexia nervosa.

Perusal of any magazine stand or book store today will reveal a plethora of articles and "how-to" books on weight loss, exercise, and achievement of the "perfect" body, with the implied promise of greater happiness, success in career and relationships, and a better life. Advertisements in particular link beauty and slimness with the portrayal of success and competence for women. This may be one of the reasons that thinness has traditionally been more prevalent in higher social stratas. In other words, personal effectiveness is defined in terms of body size. There is also a certain moral righteousness or superiority ascribed to the woman who can deny nourishment to

lose weight or stay slim. The slim woman is seen as self-denying, and her will power is envied and respected.

Part of this emphasis on appearance in women stems from traditional role expectations for women, whose status and security have often depended on her perceived attractiveness to males. Recognition, rewards and perceived self-worth have been less related to actual skills, values or competencies for women than for men. More recently, following the influence of the women's movement, there has been some shift in this focus, but the results have not always been beneficial. In some ways, these changes may be detrimental. While women are now more able to compete and achieve along with their male counterparts in the work place, they are still expected to maintain their traditional feminine roles of wife, mother, lover and homemaker. The messages and demands are clear and mixed: be competent, be competitive, achieve, be slim, be attractive, be nurturing. Slimness has become associated with and a symbol of, competence in women. Boskind-Lodahl views anorectic symptoms as a result of a struggle to please others and validate one's own self worth.

Garner and Garfinkel (1980) noted higher levels of anorectic symptoms, including fear of fat and amenorrhea, in women in high achievement settings where there was implicit pressure to be thin (dance or modelling schools). They suggest that cultural pressures for thinness may interact with certain predisposing factors (family, personality, biochemistry) to function as precipitating or maintaining variables in vulnerable

teenagers. The resulting weight loss, which is reinforced by society, then leads to other symptoms (delayed gastric emptying, depression, anxiety, perceptual and cognitive disturbances) which perpetuate the illness. Weight loss, per se, rather than thinness, becomes the goal. As Garfinkel (1981) notes, adolescent girls may "believe weight control is equal to self-control and this is equal to beauty and success" (p. 221). Herman and Kozlowski (1979) have suggested a possible relationship betwen perceptions of "character" and body size. Of course, these standards of thinness and the emphasis on dieting and keeping fit are frequently held by normal weight girls and women. However, it is possible that, given the anorexic's preoccupation with weight, figure and diet, she is more easily influenced by such expectations, and these standards are more central to her self-image. The normal individual would derives her self-esteem and feelings of competence in ways other than striving for bodily control. Perhaps, along with the hypothesized fear of loss of control, that to become anorexic one must also adhere to the stereotype of "thin is competent".

As the "culture bearers", the families of anorexic patients convey societal standards. Crisp and Fransella (1972) have noted an undue emphasis in these families on the importance of size, weight and eating habits, with weight control being symbolic of well-being and self-control. Kalucy, Crisp and Harding (1977) believe that such issues are used as a means of interacting and communicating, are part of the genesis of the disorder, and are

indicative of a restricted range of coping mechanisms.

VIII. Summary

A number of the individual, familial and sociocultural factors considered in the foregoing review converge to provide a context for viewing certain features of eating disorders.

Bruch (1973) and Boskind-Lodahl (1970) have noted the anorexic's lack of inner-directedness and sense of ineffectiveness, evident in a disturbance of body image and interoceptive awareness. Such patients are frequently unaware of or inaccurate in interpreting internal signals such as hunger, satiety, or emotional states. These signals, which normally function as cues for adaptive behavior, apparently trigger a fear of loss of control, so are cues for control-seeking behaviors in anorexics and bulimics.

Interactions and communications in the families of anorexics are often coloured by conflicts over autonomy and independence. The vehicle for this communication seems to center on food, weight, self-control and achievement related issues. These individual and family factors which serve to magnify or distort the importance of self-control through bodily control receive validation through sociocultural norms and expectations. Social restraint is expected in regard to eating behavior and dieting. Social stereotypes about weight and attractiveness have connotations of competence and self-control.

In an individual, especially a prepubertal girl coping with a growing awareness of her body and sexuality, with changing family and social role demands, it is not surprising that the conflict finds expression via a struggle for bodily self-control.

It is suggested that this predominant need for control, as a central component of self esteem, operates as a maintaining variable in the disorder. A study by Fransella and Crisp (1970) reported the relatedness for obese women, of self-esteem and weight. They demonstrated that an evaluative switch from good to bad preceded weight gain. This would suggest that negative self evaluations resulted in subjects' foregoing their attempts to diet, and reverting to former "overeating" patterns. Similarly Fransella and Crisp (1979) reported that anorexic patients maintained weight gain only after they stopped seeing body weight as an important issue, i.e. when their thinking was no longer "totaly dominated by thoughts of ... weight" (Crisp & Fransella, 1972).

The interaction between self control and self esteem may function in the following way: Because of her high standards for achievement and competence, and low self esteem, many intra and inter-personal events may be seen as failure experiences by the anorexic patient. These events probably cover a wide range, such as criticism from others, disagreements with family members, feelings of social inadequacy, or viewing herself in a mirror and not liking what she sees. Such events will serve as further

evidence of her inability to function adequately, and reinforce her negative self image. It is proposed that anorexics and bulimics respond to such feelings with lowered mood and self esteem, characteristic behaviors related to food and eating and by "feeling fat".

It is hypothesized that the restricting anorexic responds to this failure, and "fat feeling" by engaging in dieting to re-affirm her sense of self-control. The bulimic responds by, initially bingeing, since she has lost all feelings of control anyway, and subsequently, to allay her feelings of guilt, anxiety and self-recriminations, vomiting. This allows her, at least temporarily, to believe she has re-established control over her situation.

It is not known whether this sequence of events in regard to negative information or failure experiences is reversed in regard to positive experiences, i.e. whether the anorexic is more likely to eat normally and the bulimic more likely to avoid bingeing, but it seems likely.

Overview of the Present Study

The current study was proposed as an analogy to the above sequence of events. Anorexics and bulimics were presented with negative information about themselves (failure experience), to investigate whether it would cause the restricter to restrict and the bulimic to overeat when presented with the opportunity to eat. The effect on "feelings of fatness" was also examined by measuring the amount of body image distortion prior to and following the feedback.

A group of anorexics, a group of bulimics and a group of control subjects completed a number of psychometric inventories, including a self-control measure, a self esteem inventory, a depression scale, the Eating Disorders Inventory and the Restraint Scale. In addition, participants rated themselves on a number of pertinent dimensions including competence and self-control. Finally, a stereotype measure was completed (These measures are described on pp 59 - 66).

After completion of these questionnaires, subjects met individually with the experimenter. An initial body image measure was taken, using the distorting camera technique. Positive or negative feedback regarding their level of self control was given to each subject, relative to her own prior self rating. A second body image measure was taken, after which the subject was taken to another room for a prepared meal. The

amount consumed was surreptitiously monitored. Finally, body image was measured again.

The purpose of the study was to explore the following questions:

1. If body image distortion is linked to the anorexic's sense of ineffectiveness or lack of control, does feedback about her level of control affect body image and eating behavior?

2. What are the relationships among self-control, body image distortion and self esteem in anorexics, bulimics and normal weight women?

3. Do people adhere to stereotypes about weight and competence? If so, do they differ for women with eating disorders compared to normal women?

4. Does this stereotype influence or mediate the relationships among self control feelings, eating behavior and body image distortion?

The following specific hypotheses were tested:

1. Anorexics and bulimics were expected to respond differentially to positive or negative self-control feedback, relative to control subjects. Sensitivity to external information about their level of self-control was expected to result in a decrease in body image distortion following positive feedback and an increase in body image distortion following negative feedback. No specific prediction was made regarding the difference between anorexics and bulimics.

2. This feedback was expected to have an effect on food consumption, with anorexics receiving positive feedback expected to eat more that anorexics receiving negative feedback. Bulimics receiving positive feedback were expected to eat less than bulimics receiving negative feedback. Type of feedback was not expected to affect caloric consumption for control subjects, who would be expected to eat in response to internal rather than external cues.

3. Food intake following self-control feedback was expected to be a significant factor in change in body image, for anorexic and bulimic subjects.

4. A relationship was predicted between self esteem variables and body image distortion in anorexics and bulimics, with more distortion being associated with lower self esteem. Similarly, higher scores on the Eating Disorders Inventory was expected to be related to greater distortion.

5. A stereotype about weight in the nature of "thin is competent" was predicted for all subjects, but this was expected to be stronger for the eating disorder groups. It was also expected that degree of adherence to stereotypes about "thinness" or "fatness" would be related to degree of body image distortion for anorexic and bulimic patients, but not for normal weight control subjects.

B. Method

Three groups of subjects, comprised of patients with anorexia nervosa (restricters), patients with bulimia nervosa (bulimics) and normal weight controls, were tested. Subjects completed a standard questionnare battery, to be described below. An initial body image distortion measure (B1) was followed by the feedback manipulation regarding level of self-control. A subsequent body image distortion measure (B2) was followed by a standard meal and a final body image distortion measure (B3).

I. Subjects

Eating Disorder Subjects

The initial request for participants for the patient groups was made via a brief consent form included in a standard test battery given to new eating disorder patients in the Behavior Therapy Services of Shaughnessy Hospital between August, 1983 and June, 1984.

The 98 patients who returned these and met the necessary diagnostic criteria were telephoned by the experimenter. During this contact, the parameters of the study were outlined, participation requested, and address obtained for mailing of the psychometric assessment package. Of the 59 patients (28 anorexics and 31 bulimics) who agreed to participate in the study, 6 anorexics and 11 bulimics failed to return the psychometric data. Of these, 4 anorexics declined to participate in the lab portion of the study involving the body image measures and meal, leaving 18 anorexics and 20 bulimics who completed the body image measures.

Anorexia nervosa patients (Restricters)

Of the 22 subjects who used dieting as their only weight control method, 15 met the modified DSM III criteria for anorexia nervosa, with percentage of average weight ranging

between 61% and 80%. [1] Another 5 patients met the criteria, except current weight was between 80% and 82% of average weight, with one patient at 83% of average weight at time of testing. The mean weight for all subjects was 73.7% of average, SD = 7.3. All restricting anorexics were amenorrheic and had been for at least 6 months previously. These subjects maintained their low weight throught restriction of caloric intake, and did not engage in eating binges, vomiting or laxative abuse. They all admitted to a fear of becoming fat, and a desire for a thin body shape.

Bulimia nervosa patients (bulimics)

The patients in this group, numbering 20, met the criteria for bulimia nervosa outlined by Russell (1979) including fear of becoming fat and habitual binge eating and self induced vomiting.

There was no specific weight criteria for this group. Their mean weight, expressed as a percentage of average, was 94.6%, SD = 9.

Normal weight control group

The control group consisted of female university students of average weight for their height (+/- 10%), with no history of weight or dieting problems, or eating disorders. Responses to

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[1]Average weights according to The Metropolitan Life Insurance Company actuarial figures, 1981.

requests for participants in a research study were received from 39 women. Of these, 6 failed to complete the psychometric data, and 7 had to be eliminated due to not fulfilling the weight requirements; in all cases they were less than 90% of average weight. This left 26 control participants, with a mean weight, expressed as a percentage of average weight, of 96%; SD = 3.8.

II. Materials and Measures

Body Image Distortion Measure

Using the distorting video camera technique described in Freeman, Thomas, Solyom and Hunter (1984), body image measures were obtained for each subject.

This procedure assesses perception of body size using a modified video camera which permits a horizontal distortion ranging from .8 to 1.4 times the actual size.

The subject, standing 2 metres away from two connected video monitors placed at eye level, sees a frontal view of herself in one monitor, and a profile view of herself when she turns to face the other monitor. The experimenter holds a control box which varies the image on the monitor from thinner to fatter. The subject is asked to say "stop" when the image on the screen appears to be her actual size. The method of limits is used, such that on each frontal and profile measure the first and third trials start from the thinnest image, and the second and fourth start from the fattest image.

The distorting effect, essentially variations in the breath of the lines comprising the television image, results from varying the voltage; thus the reading on a voltmeter attached to the camera and video screen reflects degree of distortion. This

voltmeter has been calibrated to correspond to the amount of distortion of an object on screen, with a 100 mm. line being used for the calibration (Freeman et al., 1984, pp. 411-412).

The amount of distortion is read from a meter connected to the camera, and recorded by the experimenter. As per the Slade and Russell (1973) procedure, each estimate results in a score derived from the ratio of perceived size to real size x 100, with 100 representing an accurate estimate. Scores over or under 100 represent over and under estimation, accordingly. A score is derived for each frontal and profile measure, and the four are averaged to result in one profile and one frontal estimate of body size, at each time of measurement.

Standard Meal

The standard meal consisted of three sandwiches cut in quarter portions, and a glass of orange juice. The caloric content of the food was estimated as follows[1]:

cheese and lettuce .....295 calories

tuna .....320 calories

egg .....320 calories

orange juice .....80 calories

These sandwiches were chosen because of their variety, their roughly equivalent caloric content, and because of a

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[1]Caloric content was estimated by Ms. Ramona Josefson, Dietician, Shaughnessy Hospital Food Services

frequent tendency of anorexics and bulimis to avoid meat. All sandwiches were made with whole wheat bread.

The number of quarter sandwiches(or portion thereof) and the proportion of orange juice consumed by each subject was recorded at the end of each testing session, and number of calories calculated.

Self report measures

These are presented in the Appendices, except for the Tennessee Self Concept Scale which is excluded due to copyright restrictions.

Eating Disorders Inventory (EDI)

The EDI is a 64-item self report measure designed to assess common attitudinal and behavioral dimensions in anorexia and bulimia nervosa (Garner, Olmstead & Polivy, 1983). The EDI consists of eight subscales which measure (1) Drive for thinness, (2) Bulimia, (3) Body dissatisfaction, (4) Ineffectiveness, (5) Perfectionism, (6) Interpersonal distrust, (7) Lack of interoceptive awareness, and (8) Maturity fears. Each subscale consists of 6 to 10 statements reflecting that dimension, rated on a 6 point scale from "never" to "always". The measure was found to successfully differentiate anorexia nervosa patients from obese and normal weight women. Further, a

group of recovered anorexics scores in the range of normal women.

The Beck Depression Inventory (BDI)

This inventory was developed as a self report quantitative measure of level of depression (Beck, Ward, Mendelson, Mock & Erbaugh, 1961). It contains 21 multiple-choice format items reflecting affective, somatic, cognitive and motivational symptoms typical of depression, which are summed to yield a total score of 0 - 63. The initial study established its validity with a clinical population, and subsequent studies have applied the BDI in a university population (Bumberry, Oliver & McClure, 1978).

The Personal Beliefs Inventory (Internal-External Locus of Control Scale)

The original I-E Scale was a 29-item (6 of these were filler items) forced choice inventory designed to assess an individual's general expectancies of control over one's life (Rotter, 1968). Items reflecting either an internal or external locus of control in relation to various events are summed to yield a possible total of 0 to 23, with high scores reflecting an external orientation.

The version used in this study was one developed by Reid and Ware (1974) and includes an 8-item self control subscale, reflecting beliefs about perceived control over one's impulses, desires and emotions. Reid and Ware felt that this distinction was important in order to distinguish control of one's self from control of others or the environment. This subscale results in a score of 0 to 8, with high scores representing an external locus. Locus of control has been used previously to measure ineffectiveness in anorexia nervosa, with externality being associated with greater levels of depression and higher restraint (Hood, Moore & Garner, 1982). Other researchers have reported a positive relationship between this scale and body size overestimation (Pierloot & Houben, 1978).

Eating Habits Questionnaire (Restraint Scale)

This is a scale developed to reflect the degree of conscious restraint exerted over weight and eating related behavior (Herman & Mack, 1975). It consists of 10 items scored from 0 to 3 or 0 to 4. Examples are: "How often are you dieting?" or "Do you give too much time and thought to food?", with possible responses of "never" to "always". The responses are totalled for a possible score of 0 to 35. Although usually used to divide normal subjects, by a median split, into high or low restraint individuals, this is less practical for eating disorder patients, who tend to score significantly higher than

normals on this scale, with bulimics scoring higher than restricters (Polivy, 1978). This is not unexpected, given the chronic dieting behavior of these patients.

This dimension has been found to be associated with counterregulatory behavior (overeating) in normal and obese subjects (Ruderman & Wilson, 1979). Polivy and Herman (1976) found that depressed patients classified as restrained on this scale gained weight while depressed, while those classified as unrestrained patients lost weight.

The Tennessee Self Concept Scale (TSCS)

The Tennessee Self Concept Scale was developed as a multi-dimensional measure of an individual's view of him or herself (Fitts, 1965). It consists of 100 self descriptive statements, is self administered and applicable to a wide range of individuals regardless of level of adjustment or pathology.

The multi-dimensional nature of the scale refers to the division of self concept into Identity, Self-satisfaction, and Behavior, and to Physical, Moral, Personal, Family and Social Self Concept. The Variability score reflects consistency in self concept, while the Self criticism score reflects openness and capacity for healthy self criticism. Other scales were derived empirically to differentiate groups manifesting a particular psychopathology, and include the Defensiveness, General Maladjustment, Psychosis, Personality Disorder and Neurosis

scales. Fitts and others have suggested that an individual's self perception is an important concept in gaining a complete understanding of his or her level of adjustment or psychopathology. Low self-esteem or feelings of ineffectiveness have been cited as a predisposing or maintaining factor in anorexia (Bruch, 1962; Garner & Garfinkel, 1983). The author is not aware of any studies which have used the TSCS to examine self concept and its relationship to other variables in eating disorders.

Self Assessment Questionnaire (SAQ)

This scale was designed for use in the current study. It consists of self ratings from 1 to 10 on five characteristics: competence, assertiveness, confidence, control and social skills. These ratings were used primarily as the basis of the self control manipulation, so that the positive or negative feedback was relative to the individual's self-assessment. Each item was considered separately.

Person Perception Scale

This scale was developed for use in the current study, as a means of directly measuring weight related stereotypes. It consisted of three copies of a rating scale, each accompanied by a different photograph.

The Rating Scale: The rating scale consisted of 12 bipolar adjectives, such as cold-warm, not in control-in control, and weak-strong, with the numbers 1 to 5 between.

Stimulus Photographs: The photographs which subjects were asked to rate on the above dimensions consisted of women of three different apparent weights (underweight, normal, overweight). The models for the photographs were average weight volunteers dressed in plain black clothing. When posing for the photographs they were asked to stand with arms at their sides, and to display no variation in facial expression. They were standing two metres in front of a video monitor, facing the distorting video camera described earlier. The image on the screen was distorted such that the distortion was 20% below accurate, zero, and 20% above an accurate image. A photograph was then taken of this image from a second monitor in a darkened observation room. Thus, each of the three volunteers was photographed at three different apparent sizes.

In selecting the three photographs for each subject to rate, the order of presentation of the model and the size of the model was balanced. Thus, each subject made 12 ratings each on 3 photographs of women varying in apparent weight. The scale was presented as an attempt to understand people's attitudes and beliefs about others. The Person Perception Scale and stimulus photographs are presented in the Appendices.

III. Procedure

Eating disorder subjects were tested in a lab at Shaughnessy Hospital, while control subjects were tested in a similar setting at Simon Fraser University.

During the initial telephone contact, subjects were informed of the purpose of the study, the time requirements, and the experimental procedure. Subjects who expressed a willingness to participate were asked for their mailing address, and the questionnaire package was sent to them, with a self-addressed, stamped return envelope. If this package was not returned within 10 days, the individual was telephoned and reminded of the study. A consent form was included in this package for the subject's signature, along with a description of the study.

Subjects were also informed during the initial contact that they would be asked to fast after 8:00 p.m. the evening prior to testing, that testing would take place between 10:00 a.m. and 2:00 p.m., and that they would be asked to wear a leotard for the body image measures, and to eat lunch during the procedure.

When the questionnaire package was returned, the experimenter again contacted the participant to arrange testing at the earliest available date. It was necessary to obtain the questionnaires before arranging the testing, as the self control feedback was purportedly based on subjects' scores on these questionnaires.

The subject was met at the testing location, her weight and height measured, and she was shown to a room to change into the leotard.

The body image procedure was explained to the subject and the initial measure was taken. Following this measure, the subject was given the feedback, as follows:

> "I'd like to take a few minutes before we go on to talk to you about some of the questionnaires you completed. Do you remember this one (Subject was shown the SAQ, on which she had rated herself on various dimensions)? What we did was compare the ratings you gave yourself with your actual scores on these tests or sub-tests. So we have an objective score for you for each of these characteristics. We consider that you're fairly accurate if you score within plus or minus one point of where you rated yourself. When we compared your scores with your self-ratings, you are actually pretty accurate on your ratings for most of these dimensions. The only one that you were fairly inaccurate on was this one, to do with self control. The test that measures this has to do with how much control you feel you have over your impulses, feelings and behaviors in general. While you though you would rank about x, in fact your results place you at about x, two points higher (or lower, depending on the condition) than you thought you would be. This suggested that you have more (less) control over yourself than you intially thought. As I mentioned, your other ratings were very close to your scores; quite accurate.

The subject was then informed that "I'd like to leave the rest of your test results for now, but if you have any questions we'll be able to discuss them later.

The second body image measure was taken.

Subjects were then told that, as they had been informed, we would break for lunch. The rationale for providing lunch was as follows: (1) "Since we ask people not to eat after 8:00 p.m. the night before, and to skip breakfast, we decided it would be a good idea to provide lunch". (2) "Also, since lunch was included

in the procedure, we would like you to eat something, but want you to feel free to eat as little or as much as you wish".

Participants were shown to another room where the lunch, a selection of twelve quarter sandwiches and orange juice, had been prepared. They were told that they would be left in privacy to eat, and the experimenter would return in about 20 minutes to complete testing.

After 20 minutes, the experimenter knocked on the door, and inquired whether the subject had sufficient time, and returned with her to the testing room next door. The final body image measure was taken, and subjects changed back into their own clothes.

Participants were then debriefed as to the nature of the study, including the false feedback. The experimenter answered any further questions they had about the investigation. They were thanked for their participation. Control subjects were paid $7.00 at this time for this participation.

C. Results

I. Subject Characteristics

Demographic characteristics of subjects are shown in Table 1. Although the mean age of bulimic subjects was slightly higher than that of anorexics and controls, none of the differences was significant. Reported as a percentage of standard weight for height, restricters weighed significantly less that bulimics and controls ($p < .001$), who did not differ.

Age at onset of illness did not differ in the eating disorder groups. The bulimic group had been ill for longer, on average (6.3 years) that the restricter group (3.6 years; $F(1,40) = 6.18$, $p < .01$).

Combination of Frontal and Profile Measures

Following initial analyses on frontal and profile measures separately, it was decided to combine(average) these into one body image distortion measure (B). Thus, the majority of analyses were computed on the combined measure (as per Freeman, Thomas, Solyom & Miles, 1983). The B Scores were first analysed in a repeated measures analysis of variance format, with two between subjects factors, diagnostic group (restricters, bulimics, controls), and self-control feedback condition (positive or negative); and one within subjects factor, body image distortion (B). This preliminary analysis indicated

Table 1: Demographic characteristics of subjects by group.

		Restricters n=22	Bulimics n=20	Controls n=26
Age	M	22.6	25.4	23.2
	SD	6.3	5.2	4.4
Weight (kg.)	M	46.5	60.4	58.7
	SD	6.9	8.5	4.4
Percentage of standard weight	M	73.7	94.6	96.0
	SD	7.3	9.0	3.8
Age at onset of illness	M	19.0	19.0	
	SD	5.4	5.6	
Duration of illness	M	3.6*	6.3*	
	SD	3.1	3.8	

*$F(1,40) = 6.18$, $p < .01$

differences in B over time. Further, since an analysis of covariance with calories consumed as a covariate proved significant, it was decided that the data were best examined by focusing primarily on difference scores. Use of change scores also addresses the issue of substantial within group variability.

Change scores were calculated by subtracting the initial score (B1) from the post-feedback score (B2); and the post-feedback score (B2) from the post-prandial score (B3). The first score represents the effect of the self-control manipulation, while the second represents the effect of eating a meal. Finally, B1 was subtracted from B3; this score represents the total change in body image distortion from initial level to post-prandial level. These scores will be referred to as BC1, BC2 and BC3 respectively.

Subsequent analyses on BC scores utilized the two-way analysis of variance model, with diagnostic group (restricters, bulimics and controls) and feedback condition (positive or negative) as the factors. Where significant effects occurred, pairwise comparisons were made.

Following the rationale outlined by Larzelere and Mulaik (1977), a multistage Bonferroni procedure was used for multiple comparisons. This procedure involves first determining the error rate per comparison (EC), based on the familywise error rate of .05, divided by the number of comparisons to be made.

To apply the multistage Bonferroni procedure, each comparison is made using the EC, the testwise significance level. If none of the comparisons is significant at this level, the procedure is stopped, and the null hypothesis is retained. If the null hypothesis is not retained on k tests, the second stage involves resetting the significance level for the remaining tests, to the familywise error rate divided by the remaining number of comparisons. Again, if none of the comparisons are significant, the procedure is stopped. If one or more of the null hypotheses is rejected, one continues by computing a new EC, and so on until none of the comparisons is significant.

Initial Estimates of Body Size

Although no specific hypotheses were made with regard to group differences in body image measures, a greater degree of overestimation was expected to occur in the eating disorder groups. This was not the case. Restricting, bulimic and control subjects all overestimated their body size, with no significant group differences on either frontal, profile or combined measures. This was true of the post-feedback and post-prandial measures as well as the initial measure. Mean scores for B1 are reported in Table 2, and illustrated in Figures 1 and 2.

Table 2: Mean Body Image Scores; BI1, BI2, BI3*;

	BI1	BI2	BI3
Restricters			
Positive(n=9)			
M	102.74	102.57	101.82
SD	4.24	3.90	4.99
Negative(n=9)			
M	104.68	101.68	103.55
SD	7.33	7.12	6.75
Bulimics			
Positive(n=9)			
M	103.12	103.34	101.08
SD	4.27	4.10	4.03
Negative(n=11)			
M	105.33	104.14	104.08
SD	6.97	6.62	6.36
Controls			
Positive(n=13)			
M	102.26	102.03	101.52
SD	3.65	2.10	3.18
Negative(n=13)			
M	102.38	101.95	99.92
SD	3.95	4.09	6.25

*Expressed as a percentage; accurate perception = 100

Figure 1: Body Image Measures; B1, B2, B3; Restricters, Bulimics and Controls: Positive Feedback Condition.

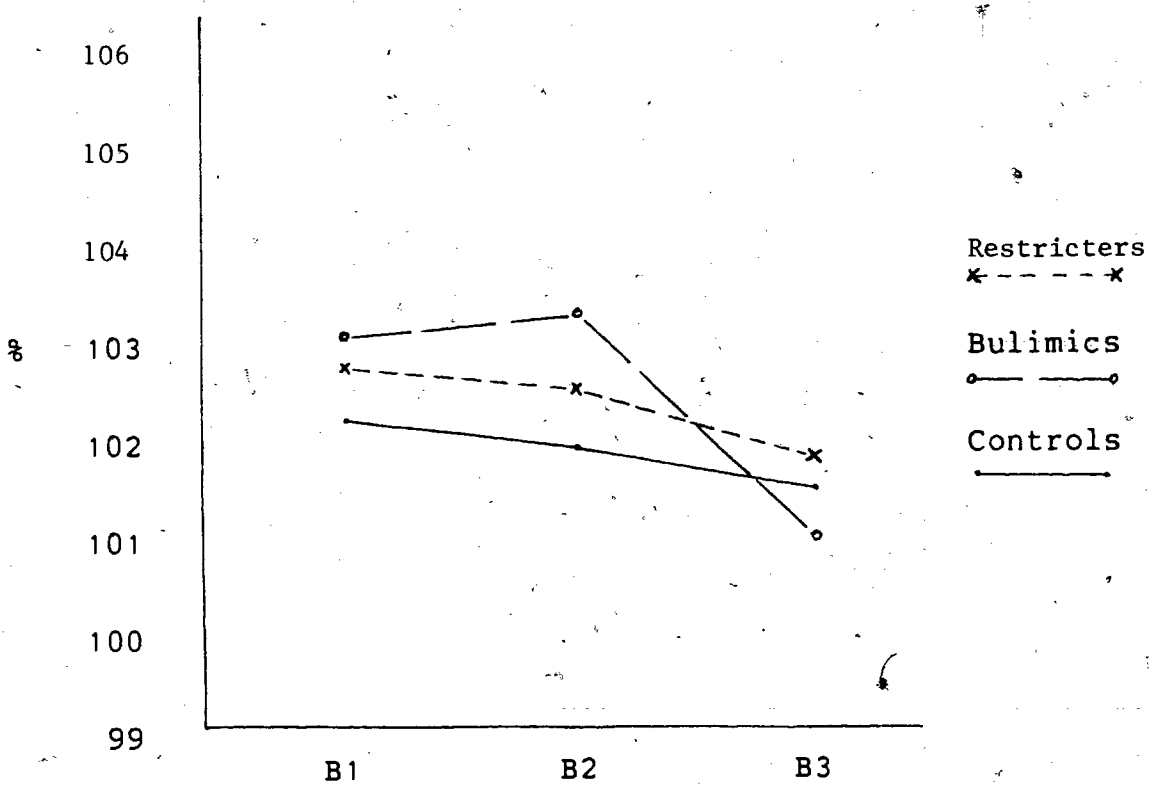
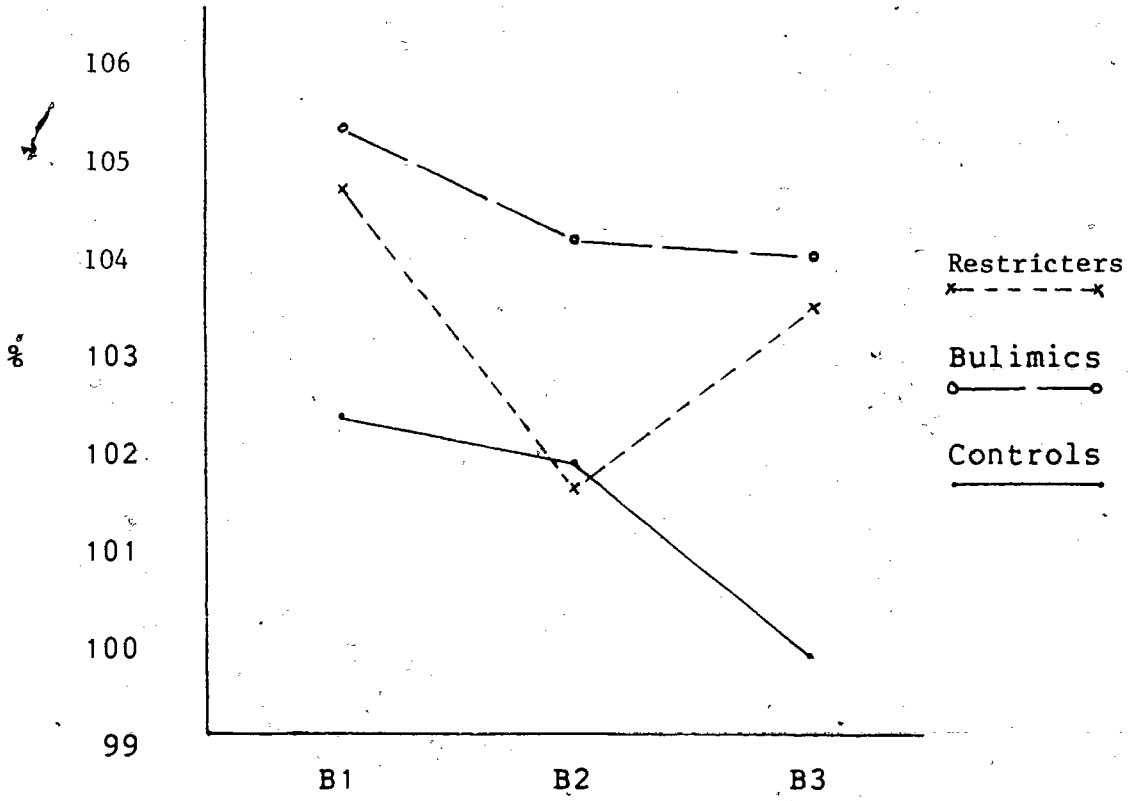


Figure 2: Body Image Measures; B1, B2, B3; Restricters, Bulimics and Controls: Negative Feedback Condition.



Analysis of Change Scores

The means and standard deviations for BC1 are reported in Table 3, with the analysis of variance in Table 4. The results of this analysis suggest that there was no immediate effect of self-control feedback on B. Further analysis of the psychometric test data, however, indicated that by chance, random assignment of subjects to feedback conditions resulted in a significant difference (by feedback condition and group) in self-esteem and self-control perceptions, such that the positive feedback groups (restricters and bulimics) were lower in self-esteem and higher on a "lack of control" dimension than the negative feedback groups. (These psychometric data will be discussed later.) In other words, the feedback given, by chance, ran counter to their pre-existing beliefs. This may account for the failure of the self-control manipulation to produce an immediate significant effect on B. Mean change (BC1, BC2) for positive and negative feedback conditions are illustrated in Figures 3 and 4.

Some support for this interpretation is derived from an analysis of variance on the second change score, BC2, which reflects the combined effect of feedback condition plus eating a meal. The means and standard deviations are presented in Table 5, with the analysis of variance in Table 6. There was a significant main effect for group ($F(2,58) = 2.97$, $p < .01$), and a significant group by condition interaction ($F(2,58) = 4.27$, $p < .05$). Collapsed across conditions, B scores in the restricter

Table 3: Body Image Change Following Feedback(BC1)

Condition		Restricters	Bulimics	Controls
Positive	M	- 0.17	+ 0.21	- 0.23
	SD	2.05	4.14	2.34
	n		9	13
Negative	M	- 3.02	- 1.19	- 0.42
	SD	3.61	5.37	3.42
	n	9	11	13

Table 4: Analysis of Variance for BC1: Group by Feedback Condition.

Source	Sum of Squares	df	Mean Square	F	p
Group	18.9918	2	9.4959	0.71	0.4945
Condition	34.4088	1	34.4088	2.58	0.1134
G X C	18.9183	2	9.4591	0.71	0.4958
Error	772.5786	58	13.3203		

Figure 3: Change in Body Image Distortion: BC1 (Post-Feedback).

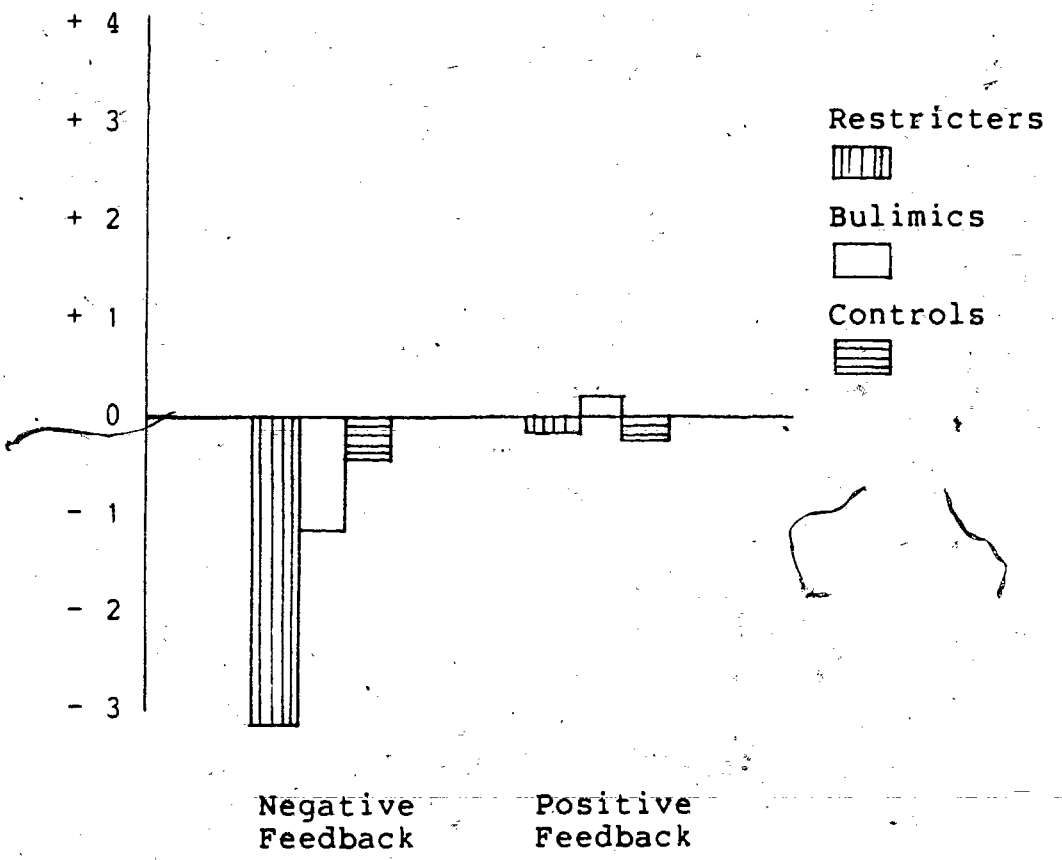


Figure 4: Change in Body Image Distortion: BC1 (Post-Prandial).

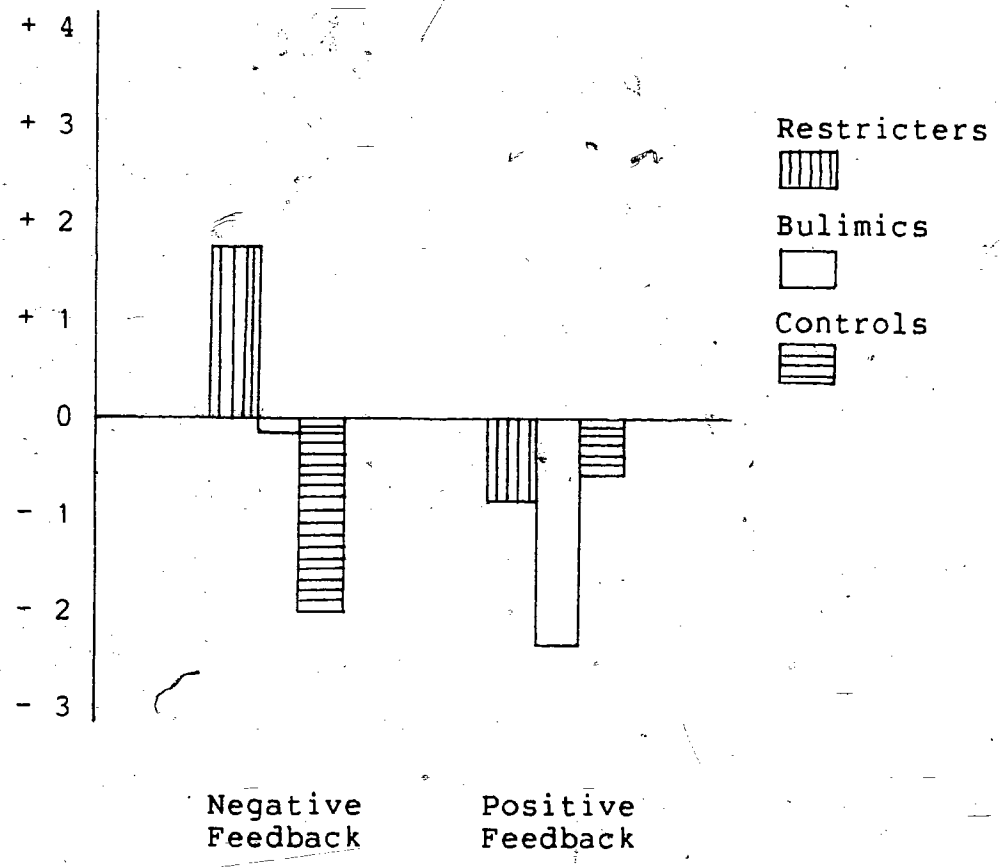


Table 5: Body Image Change Following Meal (BC2).

Condition		Restricters	Bulimics	Controls
Positive	M	- 0.75	- 2.25	- 0.51
	SD	1.79	1.89	1.88
	n	9	9	13
Negative	M	+ 1.89	- 0.05	- 2.03
	SD	3.67	2.20	3.58
	n	9	11	13

Table 6: Analysis of Variance for BC2; Group by Feedback Condition.

Source	Sum of Squares	df	Mean Square	F	p
Group	41.7964	2	20.8982	2.97	0.0592
Condition	19.0419	1	19.0420	2.71	0.1054
G X C	60.0393	2	30.0197	4.27	0.0187
Error	408.1463	58	7.0370		

group increased post-prandially (M = .57) while scores in the bulimic(M = -1.15) and control groups decreased (M = -1.27).

Restricters receiving negative feedback showed an increase in B following a meal (M = +1.89), while control subjects showed a decrease (M = -2.03). Bulimics in the positive condition tended to show a decrease in B after eating, relative to restricters and control subjects. Following pairwise comparisons employing the Bonferroni correction (reported in Table 7), a significant difference was found between restricters (M = +1.89) and controls (M = -2.035) in the negative feedback condition; ($t(2,58) = -3.42$, $p < .0012$). When the Bonferroni correction was disregarded, the restricter positive and negative conditions differed, such that an increase in distortion occurred in the negative feedback condition (M = +1.89), compared to a decrease in the positive feedback condition (M = -0.75; $t(2,58) = 2.11$, $p < .038$). Similarly, a tendency toward significance occurred between the bulimic positive(M = +0.59) and negative(M = +2.25) feedback conditions (t = -1.84, $p < .07$), and between the bulimic (M = +0.59) and control (M = +2.03) negative conditions ($t(2,58) = -1.82$, $p < .07$).

An analysis of variance was conducted on BC3. This analysis showed no significant main effects or interactions. The means and analysis of variance are presented in Tables 8 and 9.

Because of the large initial variance in body image measures, the effect of initial scores were investigated as a possible covariate of change scores. Initial level of B proves

Table 7: Pairwise Comparisons Among Means for BC2.

Comparison	Mean Difference	t	df	p
Restricter Positive/ Restricter Negative	-2.64	-2.11	58	.0388
Restricter Positive/ Restricter Negative	-1.51	-1.20	58	.2335
Restricter Positive/ Control Positive	.24	0.21	58	.8365
Restricter Negaive/ Bulimic Negative	-1.95	-1.64	58	.1067
Restricter Negative/ Control Negative	-3.93	-3.42	58	.0012*
Bulimic Negative/ Control Negative	-1.98	-1.82	58	.0743
Bulimic Negative/ Bulimic Positive	-2.20	-1.84	58	.0706
Bulimic Positive/ Control Positive	1.74	1.52	58	.1349

*p < .05

Table 8: Body Image Change Following Feedback and Meal (BC3).

Condition		Restricters	Bulimics	Controls
Positive	M	- 0.92	- 2.03	- 0.74
	SD	2.72	4.53	2.22
	n	9	9	13
Negative	M	- 1.13	- 1.25	- 2.45
	SD	3.75	4.75	5.65
	n	9	11	13

Table 9: Analysis of Variance for BC3; Group by Feedback Condition.

Source	Sum of Squares	df	Mean Square	F	p
Group	4.5592	2	2.2796	0.13	0.8773
Condition	2.2563	1	2.2563	0.13	0.7199
G X C	18.1382	2	9.0691	0.52	0.5962
Error	1008.1200	58	17.3814		

to be a significant covariate for BC1 and BC3, as can be seen in Table 10. However, B1 is not a significant covariate for BC2, and the group by feedback interaction for this variable is retained.

Table 10: Analysis of Covariance for BC1, BC2, BC3, with B1 as Covariate.

Source	Sum of Squares	df	Mean Square	F	p
		BC1 (B2 - B1)			
Group	15.6748	2	7.8374	0.72	0.491
Condition	16.5957	1	16.5957	1.52	0.222
G X C	11.8948	2	5.9474	0.55	0.582
Covariate(B1)	151.7002	1	151.7002	13.93	0.004
Error	620.8783	57	10.8926		
		BC2 (B3 - B2)			
Group	40.7147	2	20.3573	2.85	0.065
Condition	17.1220	1	17.1720	2.41	0.126
G X C	57.6463	2	28.8231	4.04	0.022
Covariate(B1)	1.5696	1	1.5696	0.22	0.640
Error	406.5766	57	7.1329		
		BC3 (B3 - B1)			
Group	9.8453	2	4.9226	0.32	0.729
Condition	0.0049	1	0.0049	0.00	0.955
G X C	28.0188	2	14.0094	0.90	0.411
Covariate(B1)	122.4077	1	122.4077	7.88	0.006
Error	885.7122	57	15.5388		

II. Caloric Consumption

With the only instructions regarding the meal being "to eat as much as you wish", and the amount consumed varying widely, caloric consumption was treated as a dependent variable. A group by feedback condition analysis of variance was performed, which indicated a significant group effect. Controls consumed more calories ($\underline{M}$ = 416) than bulimics ($\underline{M}$ = 243), who in turn consumed more than restricters ($\underline{M}$ = 139). This was true for both positive and negative feedback conditions. There was no significant effect of feedback condition, and no interaction. These results are presented in Tables 11, 12 and 13.

Restraint and Consumption

The relationship between scores on the restraint scale and eating behavior was of considerable interest. Accordingly, correlations between restraint scores and calories consumed were calculated for the three groups separately. While a negative correlation between the two variables was found for restricters ($\underline{r}$ = -0.21) and controls ($\underline{r}$ = -0.31), a positive correlation resulted for bulimics ($\underline{r}$ = +0.20). While none of these correlations was significant per se, the differences between the correlations for restricters and bulimics and between controls and bulimics was significant; ($\underline{p} < .005$).

Table 11: Mean Estimated Calories Consumed by Group and Feedback Condition.

Condition		Restricters	Bulimics	Controls
Positive	M	162.2	247.4	409.2
	SD	160.1	106.2	80.2
	n	9	9	13
Negative	M	116.6	240.0	424.6
	SD	125.1	144.2	94.5
	n	9	11	13

Table 12: Analysis of Variance on Calories Consumed: Group by Feedback Condition.

Source	Sum of Squares	df	Mean Square	F	p
Group	867586.906	2	433793.453	30.94	0.000
Condition	2447.282	1	2447.282	0.17	0.677
G X C	9889.851	2	4994.925	0.35	0.704
Error	813281.162	58	14022.089		

Table 13: Pairwise Comparisons on Calories Consumed by Group.

Comparison	Mean Difference	t	df	p
Restricter/Bulimic	-103.91	-2.75	61	0.0078*
Restricter/Control	-277.48	-7.78	61	0.0000*
Bulimic/Control	-173.57	-5.02	61	0.0000*

*$p < .05$

Body Image Distortion and Caloric Consumption

In view of the expected relationship between body image and consumption, an analysis of covariance was performed on calories, with initial body image scores as the covariate. This analysis is reported in Table 14. The effect of initial degree of distortion as a covariate of differences in calories consumed approached significance ($F(1,57) = 3.52$, $p < .06$) suggesting a possible relationship between initial body size perception and eating behavior.

Table 14: Analysis of Covariance for Calories with B1 as Covariate.

Source	Sum of Squares	df	Mean Square	F	P
Group	796060.6259	2	398030.3129	29.62	0.000
Condition	336.7518	1	336.7518	0.03	0.874
G X C	7167.4195	2	3583.7097	0.27	0.766
Covariate(B1)	47348.6478	1	47348.6478	3.52	0.065
Error	765932.5145	57	13437.4125		

III. Factor Analysis on Psychometric Data

The relationship among body image, self concept, self control and other indicators of eating and weight related attitudes was of major interest in the current study. As a means of data reduction, a principal components analysis of the personality and clinical data was performed. The data on all subjects (n=68) was included in the analysis.

Included in the principal components analysis were the fifteen subscales of the Tennessee Self Concept Scale, the eight subscales of the Eating Disorders Inventory, the Eating Habits Questionnaire (Restraint Scale), the Beck Depression Inventory, the I-E Score and subscale, Personal Self Control,and the five self ratings on the Self Assessment Questionnaire; 32 variables in all.

The eigenvalues for each factor in the initial principal components analysis are presented in Table 15. A number of possible solutions were examined, applying a oblique quartimin rotation. The three factor solution was retained as the most logical for interpretation; the factor loadings for this solution are presented in Table 16.

On Factor 1, 10 of the self-esteem subscales from the Tennessee Self Concept Scale had positive loadings in excess of .7, with more moderate loadings for two more subscales. Moderate positive loadings were also obtained for the self-ratings of

Table 15: Eigenvalues for Principal Components Analysis on Psychometric Data.

Factor	Variance explained	Cumulative proportion of total variance
1	16.736093	.523003
2	2.822805	.611216
3	2.096200	.676722
4	1.383500	.719956
5	1.107826	.754576
6	.988384	.785463
7	.806516	.810666
8	.745880	.833975
9	.641968	.854037
10	.557729	.871466
11	.509623	.887391
12	.456805	.901667
13	.384255	.913675
14	.379829	.925544
15	.370658	.937127
16	.293503	.946299
17	.254730	.954260
18	.241413	.961804
19	.209065	.968337
20	.185435	.974132
21	.155374	.978987
22	.128695	.983009
23	.104325	.986269
24	.100163	.988399
25	.088303	.992159
26	.058276	.993980
27	.053706	.995658
28	.046139	.997100
29	.044317	.998485
30	.028214	.999367
31	.018934	.999958
32	.001336	1.000000

Table 16: Factor Analysis on Psychometric Data: Sorted Rotated Factor Loadings.

	Factor 1	Factor 2	Factor 3
Identity*	.962	.015	.059
Family self concept*	.945	.245	.068
Behavior*	.890	-.040	-.100
General maladjustment*	.880	-.195	.102
Personality disorder*	.826	.169	-.241
Social self concept*	.775	-.147	.196
Moral self concept	.770	.172	-.321
Neuroticism*	.770	-.269	-.060
Acceptance*	.728	-.270	-.141
Defensiveness*	.698	-.135	-.234
Personal self concept*	.664	-.377	-.141
Physical self concept*	.596	-.369	-.150
Beck Depression Inventory	-.579	.425	-.027
Competence***	.548	-.193	.146
Ineffectiveness**	-.542	.477	.041
Locus of Control	-.507	-.018	.471
Perfectionism**	.259	.753	.010
Desire for Thinness**	-.126	.665	.457
Body Dissatisfaction**	-.048	.663	.400
Variability*	-.121	.594	.171
Confidence***	.391	-.588	.205
Maturity Fears**	-.184	.542	-.112
Assertiveness***	.287	-.534	.248
Interpersonal Distrust**	-.436	.517	-.082
Bulimia**	-.197	.119	.722
Personal Self Control	-.471	-.148	.680
Self Criticism*	-.144	.152	.589
Restraint	-.274	.455	.518
Psychoticism*	-.289	.014	-.518
Interoceptive Awareness*	-.404	.463	.379
In control***	.443	-.250	-.356
Socially skilled***	.487	-.268	.395

* Tennessee Self Concept Scale
** Eating Disorders Inventory
*** Self Assessment Questionnaire (self ratings)

competence and social skills, and self-control. Negative loadings resulted for the Beck Depression Inventory, the Ineffectiveness Scale of the Eating Disorders Inventory, and the Internal-External Locus of Control Scale. Since Factor 1 was primarily comprised of self-esteem items, it was termed the Self Esteem Factor.

The second factor consisted mainly of seven sub-scales from the EDI, with the highest loadings attributed to Perfectionism, Desire for Thinness and Body Dissatisfaction. Maturity Fears, Interpersonal Distrust and Interoceptive Awareness had moderate loadings on this factor, as did Ineffectiveness, and the Restraint Scale, with smaller, negative loadings for self-ratings of assertiveness and confidence. This factor clearly seems to reflect, and was accordingly labelled, an Eating Pathology Factor.

The highest loadings on Factor 3 were attained by the Bulimia sub-scale of the EDI, and the self-control measure on the I-E Scale (.71 and .68 respectively). Self-criticism, Locus of Control, and Restraint also had moderate positive loadings on this factor, with a negative loading for Psychoticism (TSCS). This factor was labelled a Lack of Control Factor.

As noted above, the rotation applied was not orthogonal, thus Factor 1 and Factor 2 were significantly negatively correlated (r = +0.49, p < .001). Correlations between factors are shown in Table 16a.

Table 16a: Factor Correlations for Rotated Factors.

	Factor 1	Factor 2	Factor 3
Factor 1 Self Concept	1.0		
Factor 2 Eating Pathology	-.469	1.0	
Factor 3 Lack of Control	-.198	.101	1.0

Group Comparisons on Factors

To determine whether there were any differences in the above factors by group or feedback condition, a two-way analysis of variance was performed on factor score group means. Results are shown in Tables 17 to 19.

There was a significant group main effect and group by condition interaction for Factor 1, the Self Concept Factor. Collapsed over conditions, restricters and bulimics both scored significantly lower on this factor than controls. Applying the multistage Bonferroni, restricters (M = -0.76) scored significantly lower than bulimics (M = -0.188, $t(2,64) = -2.43$, $p < .018$). Pairwise comparisons of factor score means by group are summarized in Table 20.

Pairwise comparisons, reported in Tables 21 to 23, indicated that restricters in the positive feedback condition (M = -1.12) scored significantly lower on the self esteem factor than control subjects (M = +0.97; $t(2,57) = -6.72$, $p < .0000$). (Higher scores indicate higher self-esteem). This also held true for bulimic (M = +0.45) versus control subjects (M = +0.57)in the positive condition ($t(2,57) = -4.57$, $p < .0000$) Similarly, in the negative feedback condition,restricters (M = -0.38) scored significantly lower on this factor than controls (M = +0.57; $t(2,57) = -2.95$, $p < .004$). While restricters in the positive condition had lower self esteem factor scores (M = -1.12) than restricters in the negative condition (M = -0.38),

Table 17: Personality Factor Score Means and Analysis of Variance: Group by Feedback Condition Factor 1: Self concept.

Means and Standard Deviations

Condition		Restricters	Bulimics	Controls
Positive	M	- 1.119	- 0.450	0.969
	SD	0.593	0.619	0.608
	n	9	9	13
Negative	M	- 0.379	0.010	0.570
	SD	0.929	0.864	0.670
	n	8	11	13

Analysis of Variance

Source	Sum of Squares	df	Mean Square	F	p
Group	25.7030	2	12.8515	25.06	0.000
Condition	1.0826	1	1.0826	2.11	0.151
G X C	3.8935	2	1.9468	3.80	0.028
Error	29.2304	57	0.5128		

Table 18: Personality Factor Score Means and Analysis of Variance: Group by Feedback Condition Factor 2: Eating Pathology.

Means and Standard Deviations

Condition		Restricters	Bulimics	Controls
Positive	M	0.736	0.364	- 0.842
	SD	0.540	0.696	0.377
	n	9	9	13
Negative	M	0.779	0.404	- 1.096
	SD	1.018	0.827	0.300
	n	8	11	13

Analysis of Variance

Source	Sum of Squares	df	Mean Square	F	p
Group	36.6814	2	18.3407	45.31	0.000
Condition	0.0492	1	0.0492	0.12	0.728
G X C	0.3305	2	0.1653	0.41	0.666
Error	23.0743	57	0.4048		

Table 19: Personality Factor Score Means and Analysis of Variance: Group by Feedback Condition. Factor 3: Self Control.

Means and Standard Deviations

Condition		Anorexic	Bulimic	Control
Positive	M	0.287	1.352	- 0.735
	SD	1.271	0.500	0.632
	n	9	9	13
Negative	M	- 0.715	0.477	- 0.231
	SD	0.565	0.812	.403
	n	8	11	13

Analysis of Variance

Source	Sum of Squares	df	Mean Square	F	p
Group	23.3316	2	11.6658	21.80	0.000
Condition	3.1845	1	3.1845	5.95	0.017
G X C	7.8917	2	3.9458	7.37	0.001
Error	30.5033	57	0.5351		

Table 20: Pairwise Comparisons of Personality Factor Scores by Group.

Comparison	Mean Difference	t	df	p
		Factor 1		
Restricter/Bulimic	- 0.58	- 2.43	64	0.0180*
Restricter/Control	- 1.54	- 6.82	64	0.0000*
Bulimic/Control	- 0.95	- 4.18	64	0.0000*
		Factor 2		
Restricter/Bulimic	0.50	2.47	64	0.0160*
Restricter/Control	1.76	9.28	64	0.0000*
Restricter/Control	1.26	6.58	64	0.0000*
		Factor 3		
Restricter/Bulimic	- 1.07	- 4.25	64	0.0001*
Restricter/Control	0.39	1.64	64	0.1058
Bulimic/Control	1.45	5.08	64	0.0000*

*p < .05

Table 21: Pairwise Comparisons Among Personality Factor Score Means, by Group and Feedback Condition Factor 1.

Comparison	Mean Difference	t	df	p
Restricter Positive/ Restricter Negative	0.74	2.12	57	.0380
Restricter Positive/ Bulimic Positive	- 0.67	- 1.98	57	.0526
Restricter Positive/ Control Positive	- 2.09	- 6.72	57	.0000*
Restricter Negative/ Bulimic Negative	- 0.39	- 1.17	57	.2465
Restricter Negative/ Control Negative	- 0.95	- 2.95	57	.0046*
Bulimic Negative/ Control Negative	- 0.56	- 1.91	57	.0616
Bulimic Negative/ Bulimic Positive	0.46	1.43	57	.1580
Bulimic Positive/ Control Positive	- 1.42	- 4.57	57	.0006*

*p < .05

Table 22: Pairwise Comparisons Among Personality Factor Score Means, by Group and Feedback Condition Factor 2.

Comparison	Mean Difference	t	df	p
Restricter Positive/ Restricter Negative	0.04	0.14	57	.8888
Restricter Positive/ Bulimic Positive	0.37	1.26	57	.2210
Restricter Positive/ Control Positive	1.58	5.72	57	.0000*
Restricter Negative/ Bulimic Negative	1.83	6.64	57	.0000*
Restricter Negative/ Control Negative	1.87	6.57	57	.0000*
Bulimic Negative/ Control Negative	1.25	4.78	57	.0000*
Bulimic Negative/ Bulimic Positive	0.04	0.14	57	.8911
Bulimic Positive/ Control Positive	1.21	- 4.37	57	.0001*

*p < .05

Table 23: Pairwise Comparisons Among Personality Factor Score Means, by Group and Feedback Condition Factor 3.

Comparison	Mean Difference	t	df	p
Restricter Positive/ Restricter Negative	- 1.00	- 2.82	57	.0066*
Restricter Positive/ Bulimic Positive	- 1.06	- 3.09	58	.0031*
Restricter Positive/ Control Positive	1.02	3.22	57	.0021*
Restricter Negative/ Bulimic Negative	- 1.19	3.51	57	.0009*
Restricter Negative/ Control Negative	- 0.48	- 1.47	57	.1470
Bulimic Negative/ Control Negative	0.71	2.36	57	.0215*
Bulimic Negative/ Bulimic Positive	- 0.87	- 2.71	57	.0090*
Bulimic Positive/ Control Positive	2.09	6.58	57	.0000*

*p < .05

this was significant when the Bonferroni correction was disregarded ($t(2,57) = 2.12$, $p < .03$). Bulimic subjects in the positive condition had lower mean self esteem factor scores than those in the negative condition, but this difference was not significant.

The analysis of variance for Factor 2, the eating pathology factor, is presented in Table 18. There was a main effect for group, with the highest scores obtained on this factor by restricters ($M = 0.833$), followed by bulimics ($M = 0.332$). This difference was significant ($t(2,64) = 2.7$, $p < .01$). Higher scores indicate a higher degree of pathology. Restricters ($M = +0.83$) scored significantly higher than controls ($M = -0.928$; $t(2,64) = 9.28$, $p < .0000$), as did bulimics ($M = 0.332$, $t(2,64) = 6.55$, $p < .0000$). Pairwise comparisons on Factor 2, shown in Table 22, indicated no differences between positive and negative feedback conditions for the eating disorder groups.

The pattern for Factor 3, the Lack of Control factor, was somewhat similar to Factor 1. There was a main effect for group ($F(2,57) = 21.8$ $p < .0000$), a main effect for condition ($F(1,57) = 5.95$, $p < .01$), and a group by condition interaction ($F(2,57) = 7.37$, $p < .001$). Pairwise comparisons indicated that the group main effect resulted from a significant difference between restricters ($M = -1.68$) and bulimics($M = +0.89$) ($t(2,64) = -4.25$, $p < .0001$), and between bulimics ($M = +0.89$) and controls ($M = -0.55$; $t(2,64) = 4.18$, $p < .0000$, df = 2,64). High factor 3 scores reflect a greater degree of concern or conflict with

self-control.

Pairwise comparisons on factor 3 are summarized in Table 23. The most important finding here was that restricters in the positive condition ($\underline{M}$ = +0.33) scored significantly higher than restricters in the negative condition ($\underline{M}$ = -0.65; $\underline{t}(2,57)$ = -2.83, $\underline{p}$ < .0066). Finally, applying the multistage Bonferroni, this was also true for the bulimic negative($\underline{M}$ = +0.51) and positive groups ($\underline{M}$ = 1.37; $\underline{t}(2,57)$ = -2.71, $\underline{p}$ < .009).

IV. Use of Factors in Body Image Distortion Analyses

Because of the small sample size and the distribution of scores resulting in some empty cells, the factor scores could not be used as a grouping variable. In any case, this would have been confounded, as noted, with feedback condition, so would have been inappropriate. Thus, group by condition analyses of covariance were performed on each of the change scores, examining each factor as a potential covariate of BC scores. These analyses are summarized in Tables 24 to 26. None of the factor scores was a significant covariate of change in body image.

Table 24: Analysis of Covariance on BC1 with Personality Factors as Covariates.

Source	Sum of Squares	df	Mean Square	F	P
Group	24.4015	2	12.2007	0.87	0.426
Condition	18.2881	1	18.2881	1.30	0.259
G X C	6.7868	2	3.3934	0.24	0.786
Covariates					
Factor 1	6.1143	1	6.1143	0.43	0.512
Factor 2	2.8503	1	2.8503	0.20	0.654
Factor 3	5.0825	1	5.0825	0.36	0.550
All	10.5799	3	3.5266	0.25	0.860
Error	760.9230	54	14.0911		

Table 25: Analysis of Covariance on BC2 with Personality Factors as Covariates.

Source	Sum of Squares	df	Mean Square	F	P
Group	18.1650	2	9.0825	1.23	0.299
Condition	21.0426	1	21.0426	2.86	0.096
G X C	50.0883	2	25.0441	3.40	0.040
Covariates					
Factor 1	3.5455	1	3.5455	0.48	0.490
Factor 2	0.0201	1	0.0201	0.00	0.958
Factor 3	0.0362	1	0.0362	0.00	0.944
All	3.8959	3	1.2986	0.18	0.912
Error	397.8002	54	7.3666		

Table 26: Analysis of Covariance on BC3 with Personality Factors as Covariates.

Source	Sum of Squares	df	Mean Square	F	P
Group	10.8924	2	5.4462	0.30	0.742
Condition	0.0965	1	0.0965	0.01	0.942
G X C	30.1224	2	15.0612	0.83	0.442
Covariates					
Factor 1	18.9720	1	18.9720	1.04	0.312
Factor 2	3.3496	1	3.3496	0.18	0.669
Factor 3	4.2607	1	4.2607	0.23	0.630
All	22.0841	3	7.3613	0.40	0.750
Error	983.7780	54	18.2181		

V. Factor Analysis on Stereotype Data

The other major focus of the current study was to determine whether there is a weight stereotype (i.e. "thin is competent"). If so, would it be held more strongly in restricters and bulimics than in normal weight controls, and would it function as a mediator of the relationship between self-control feedback and body image disturbance?

Preliminary analyses were performed on the stereotype scores in order to determine the best way of combining the data. The data consisted of ratings betwen 1 and 5 on 12 characteristics, for 3 photographs of apparently different size women, i.e. a total of 36 ratings by each subject. This data was subjected to a principal components analysis, in a number of different combinations, with the same pattern of results appearing repeatedly.

For the analysis presented here for interpretation, the ratings of the fat photographs were subtracted from the average of the ratings of the thin and normal photographs. This step was taken since there was not a large discrepancy between the thin and normal photos.

The eigenvalues from the principal components analysis are presented in Table 27. Of the various solutions attempted, the most logical was the two-factor solution; any further factors did not provide a clearly interpretable pattern.

Table 27: Eigenvalues for Principal Components Analysis on Stereotype Data.

Factor	Variance Explained	Cumulative Proportion of Total Variance
1	4.939465	.411622
2	2.411067	.615044
3	1.182201	.7133563
4	.639602	.766863
5	.619770	.818510
6	.559857	.865165
7	.385747	.897311
8	.339338	.925589
9	.284661	.949311
10	.263086	.971234
11	.215444	.989188
12	.129743	1.000000

The two-factor solution, which was subjected to an oblique quartimin rotation, is presented in Table 28. In control, strong, confident, assertive, and competent all had high loadings on Factor 1, all above .8, except for the last which was .69. Lower positive loadings were obtained for intelligent and socially skilled. The first stereotype factor was labelled a general competence factor.

Factor 2 consisted of high positive loadings for friendly, likeable and warm (.92, .86, .75), with moderate loadings for attractive and happy (.59, .53). Intelligent and socially skilled also had low loadings on this factor. Factor 2 was named a likeability factor. Since the rotation was not orthogonal, the two factors were significantly correlated ($r(67) = 0.27$, $p < .05$), as might be expected.

Group Comparisons on Stereotype Factors

High factor scores indicate a larger discrepancy between ratings of thin/normal versus fat stimuli, thus greater adherence to weight stereotypes. A one way analysis of variance was performed on Factor 1 group means, which indicated a significant effect for group ($F(2,64) = 4.48$, $p < .01$). This analysis is presented in Table 29, along with group means. Pairwise comparisons indicate that restricters ($M = +0.50$) scored higher than bulimics ($M = -0.31$; $t(2,64) = 2.76$, $p < .007$). Applying the Bonferroni correction, the difference

Table 28: Factor Analysis on Photograph Ratings:* Sorted Rotated Factor Loadings.

Characteristic	Factor 1	Factor 2
In control	.864	.056
Strong	.855	-.093
Confident	.853	-.052
Assertive	.845	-.201
Competent	.694	.127
Friendly	-.131	.928
Likeable	-.131	.861
Warm	-.030	.795
Attractive	.246	.595
Happy	.448	.536
Intelligent	.482	.258
Socially Skilled	.473	.352

* Factor 1 and Factor 2 $r = .27, p < .05$

between restricters ($\underline{M}$ = +0.508) and controls ($\underline{M}$ = -0.171) was also significant ($\underline{t}(2,64) = 2.43$, $\underline{p} < .017$). There was no significant difference on this factor between bulimics and controls.

As with the factors derived from the psychometric data, it was important to know whether the stereotype factors differed by feedback condition. Accordingly, a two way analysis of variance was conducted, which showed no effect for condition, and no interaction. This analysis is presented in Table 30.

One way and two way analyses of variance were conducted on Factor 2 (likeability), with no differences between or within groups on this factor. These analyses are presented in Table 31.

Table 29: Stereotype Factor Scores; Means and Standard Deviations, Factor Analysis and Pairwise Comparisons.

Means and Standard Deviations

	Restricters	Bulimics	Controls
M	0.508	- 0.311	- 0.171
SD	1.008	0.946	0.907
n	21	20	26

Analysis of Variance by Group

	Sum of Squares	df	Mean Square	F	p
Between	8.1102	2	4.0551	4.48	0.015
Within	57.8897	64	0.9045		
Total	65.9999	66			

Pairwise Comparisons

	Mean Difference	t	df	p
Restricter/Bulimic	.82	2.76	64	.0076*
Restricter/Control	.68	2.43	64	.0179*
Bulimic/Control	- .14	- 0.50	64	.6204

*p < .05

Table 30: Analysis of Variance on Stereotype Factor Scores: Factor 1; Group by Condition.

Source	Sum of Squares	df	Mean Square	F	p
Group	8.31037	2	4.1551	4.84	.010
Condition	0.34101	1	0.34101	0.40	.530
G X C	1.98211	2	0.99105	1.15	.320
Error	48.93929	58	0.85858		

Table 31: Analyses of Variance on Stereotype Factor Scores: Factor 2.

by Group

Source	Sum of Squares	df	Mean Square	F	P
Between	1.1447	2	0.5723	0.56	.510
Within	64.8552	64	1.0134		
Total	65.9999	66			

Group by Condition

Source	Sum of Squares	df	Mean Square	F	P
Group	1.2787	2	0.6393	0.57	.566
Condition	0.0461	1	0.0461	0.04	.839
G X C	0.3761	2	0.1880	0.17	.844
Error	63.3893	57	1.1120		

VI. Stereotype Factors and Body Image

An analysis of covariance on BC scores (group by condition) was conducted with Factor 1 and Factor 2 as covariates. These analyses are summarized in Tables 32 to 34. Neither of the stereotype factors was a significant covariate of change in body image distortion.

Table 32: Analysis of Covariance on BC1 with Stereotype Factors 1 and 2 as Covariates.

Source	Sum of Squares	df	Mean Square	F	P
Group	13.0353	2	6.5176	0.47	0.629
Condition	33.7412	1	33.7412	2.41	0.126
G X C	20.2777	2	10.1388	0.72	0.488
Covariates					
Factor 1	2.1052	1	2.1052	0.15	0.699
Factor 2	0.0022	1	0.0022	0.00	0.990
All	2.2897	2	1.1448	0.08	0.921
Error	769.2133	55	13.9857		

Table 33: Analysis of Covariance on BC2 with Stereotype Factors 1 and 2 as Covariates.

Source	Sum of Squares	df	Mean Square	F	P
Group	56.4994	2	28.2497	3.97	0.024
Condition	24.4538	1	24.4538	3.43	0.069
G X C	58.7195	2	29.3597	4.12	0.021
Covariates					
Factor 1	9.4519	1	9.4519	1.33	0.254
Factor 2	0.0227	1	0.0227	0.00	0.955
All	9.8765	2	4.9382	0.69	0.504
Error	391.8197	55	7.1239		

Table 34: Analysis of Covariance on BC3 with Stereotype Factors 1 and 2 as Covariates.

Source	Sum of Squares	df	Mean Square	F	P
Group	15.8620	2	7.9310	0.44	0.644
Condition	0.7458	1	0.7458	0.04	0.839
G X C	12.5094	2	6.2547	0.35	0.706
Covariates					
Factor 1	20.4787	1	20.4787	1.14	0.289
Factor 2	0.0107	1	0.0107	0.00	0.980
All	21.6475	2	10.8237	0.60	0.549
Error	984.2146	55	17.8948		

VII. Correlations Between Factor Scores and Dependent Measures

Personality Factor Scores

Correlations were computed between Factors 1, 2 and 3 and BC Scores, separately by group. These are presented in Table 35. None of the correlations between factor scores and BC scores was significant when the Bonferroni correction was applied, correcting for 9 correlations within each group. When this correction was disregarded, a higher degree of overestimation on body image measures 1 and 2 was related to higher scores on Factor 2 (eating pathology) in the restricter group ($p < .02$), This correlation was not significant for B3. There was no significant correlation between Factor 1 or 2 and BC in the bulimic or control groups. Factor 3 (control) was negatively correlated with B1 in the bulimic group, but this did not reach significance.

Stereotype Factor Scores

Correlations between Factor 1 (competence) and B Scores indicated that higher scores on this factor were related to a greater degree of distortion on measures 1 and 2 for restricters ($r = +.62$, $p < .01$; $r = +.56$, $p < .01$). This correlation

Table 35: Correlations Among Personality Factor Scores* and B.

	B1	B2	B3
Restricters			
Factor 1	-0.312	-0.218	-0.243
Factor 2	+0.512**	+0.543**	+0.475
Factor 3	-0.024	+0.055	-0.059
Bulimics			
Factor 1	+0.096	+0.127	+0.176
Factor 2	-0.004	-0.007	+0.051
Factor 3	-0.401	-0.195	+0.347
Controls			
Factor 1	+0.114	-0.070	-0.028
Factor 2	+0.049	+0.180	+0.233
Factor 3	+0.112	+0.113	-0.015

* Factor 1 Self Esteem
Factor 2 Eating Pathology
Factor 3 Lack of Control

approached significance. The correlation between Factor 2 (likeability) and body image was not significant for any of the groups. None of the correlations between stereotype factors and body image reached significance for bulimic or control groups. These figures are presented in Table 36.

Table 36: Correlations Among Stereotype Factor Scores* and B.

	B1	B2	B3
Restricters			
Factor 1	+0.628*	+0.566*	+0.410
Factor 2	+0.398	0.095	+0.011
Bulimics			
Factor 1	+0.031	+0.063	-0.072
Factor 2	-0.096	-0.351	+0.293
Controls			
Factor 1	+0.118	-0.077	-0.042
Factor 2	+0.098	+0.075	+0.142

* Factor 1 Competence
Factor 2 Likeability

VIII. Repeated Measures Analysis of Covariance

In regard to the personality factors, Factor 1 and Factor 2 (self esteem and eating pathology) were correlated with B for restricters. Factor 3 was related to B for bulimics, although not at a statistically significant level. Calories consumed was a significant covariate for B3. Hence, it was decided to use these factors in combination as covariates in a repeated measures analysis of variance. This analysis is presented in Table 37, with adjusted cell means in Table 38. The combined effect of these covariates was significant, indicating that these variables; self esteem, eating pathology and calories consumed were significant covariates of any changes in body image distortion scores. The effect of time, in fact, was no longer significant, suggesting that changes could be explained by these variables.

Although, as noted, the resulting two way analysis on adjusted cell means did not reach significance, the pattern is more apparent when seen in graphic form, as in Figures 5 and 6. Restricters and bulimics receiving negative feedback initially improved in their body image perceptions, showing less distortion, but after eating returned to their initial level, while controls continued to improve. Restricters and bulimics receiving positive feedback did not alter in their perception of body image, even after eating. While control subjects receiving

Table 37: Repeated Measures Analysis of of Covariance on B1, B2, B3; With Self Esteem Factor, Pathology Factor, and Calories as Covariates.

Source	Sum of Squares	df	Mean Square	F	P
Group	58.02618	2	29.0130	.48	0.620
Condition	44.67016	1	44.6701	.74	0.393
G X C	48.36815	2	24.1840	.40	0.671
Covariates	343.39228	1	343.3922	5.70	0.020
Error (1)	3375.73808	56	60.2810		
Time	21.58825	2	10.7941	1.69	0.190
T X G	16.30065	4	4.0751	.64	0.627
T X C	19.57298	2	9.7864	1.53	0.221
T X G X C	32.94947	4	8.2373	1.29	0.279
Covariates	2.71149	1	2.7114	.42	0.516
Error (2)	723.64235	113	6.4039		

Table 38: Mean Body Image Scores* BI, B2, B3; Adjusted for Covariates: Self Esteem Factor, Pathology Factor, Calories.

	BI1	BI2	BI3
Restricters			
Positive(n=8)	102.36	102.19	102.08
Negative(n=9)	105.12	101.98	104.69
Bulimics			
Positive(n=9)	102.74	102.96	101.68
Negative(n=11)	104.95	103.76	104.65
Controls			
Positive(n=13)	101.88	101.65	102.76
Negative(n=13)	102.00	101.57	101.22

*Expressed as a percentage; accurate perception = 100

Figure 5: Adjusted Means for B1, B2, B3;
Covariates: Self-Esteem Factor, Eating Pathology Factor, Calories.
Restricters, Bulimics and Controls;
Positive Feedback Condition.

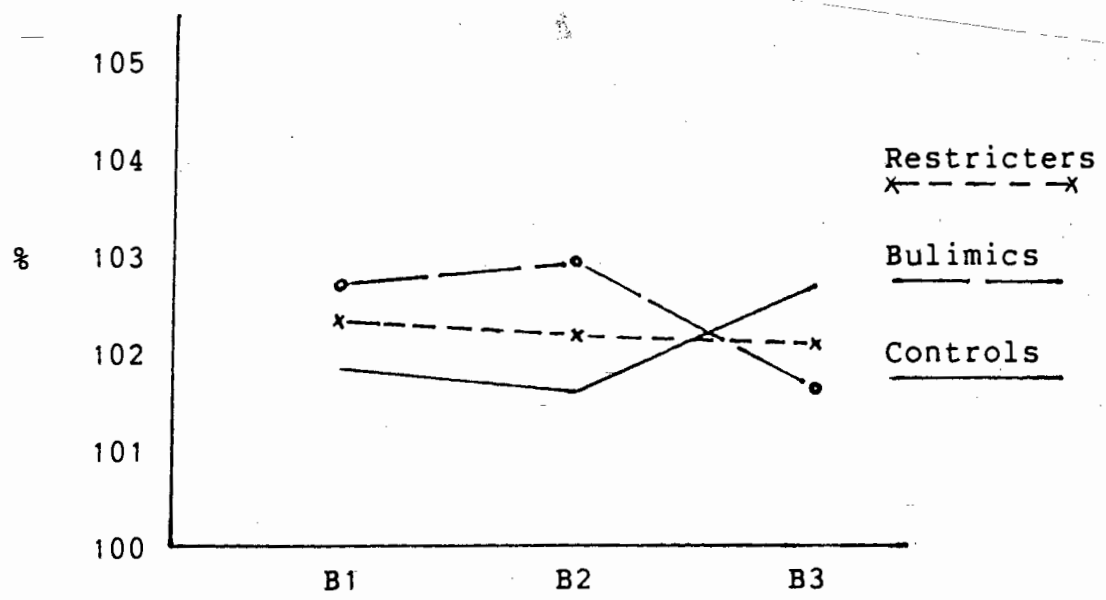
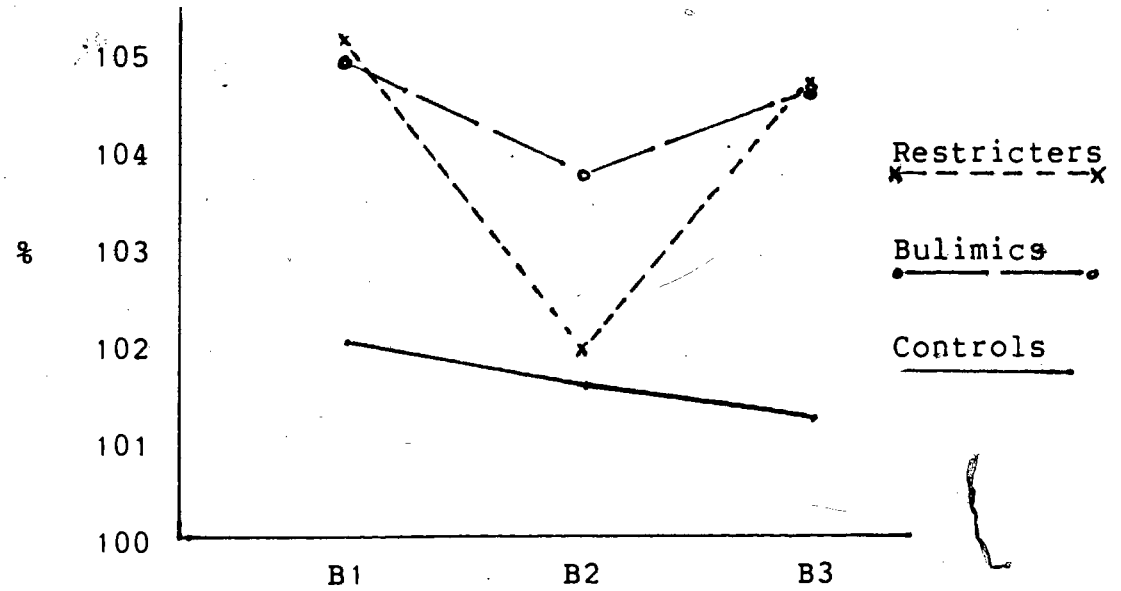


Figure 6: Adjusted Means for B1, B2, B3;
Covariates: Self-Esteem Factor, Eating
Pathology Factor, Calories.
Restricters, Bulimics and Controls;
Negative Feedback Condition.



positive feedback appeared to increase in body image distortion somewhat after eating, relative to those receiving negative feedback, the difference was not significant.

D. Discussion

I. A Note of Caution

There were a number of features of the current study which must be considered as a context for interpreting the results.

Firstly, the sample size should be larger, in order to draw stronger conclusions. However, given the strict diagnostic criteria necessarily adhered to in the study, the number of patients willing to volunteer for such research, and the time constraints of an individual researcher, the sample sizes reflect the number of subjects available for participation over a one-year period.

Secondly, eating disorder patients referred to Shaughnessy Hospital may be more chronic than those usually reported in the literature. Also, the current sample seems to reflect a somewhat unusual pattern of symptomatology, with the restricting anorexics displaying more pathology than the bulimic patients. The reverse is generally reported. This raises a question about the generalizability of the current results.

Thirdly, the sample represented herein may have been more heterogeneous with respect to age than usual, with a range of 14 to 32. Ideally, although a narrower age range would have been preferred, it is not known whether this may have influenced the results, and again, it simply reflects the composition of the available population.

II. Body Size Overestimation

The present study did not find that overestimation of body size was unique to individuals with eating disorders. Normal weight controls overestimated to a similar degree, which is in accordance with the findings of Strober et al. (1979).

The effect of the self control manipulation on body image perception was not immediately evident, in that the predicted effect did not occur. As reported earlier, the random assignment of subjects to feedback condition resulted in restricters assigned to the positive condition scoring lower on a self esteem factor than those in the negative condition. Although this difference did not reach significance under the strict Bonferroni correction, it may have been sufficient to weaken the manipulation. The direction of the difference was the same for the bulimic subject groups, although the difference was not significant.

At least as importantly, subjects in the two feedback conditions differed on the control factor. Restricters receiving positive feedback scored significantly higher on this factor than those receiving negative feedback; this was also true for the bulimic subjects when disregarding the Bonferroni correction. This factor, comprised of scores on the bulimia subscale of the EDI, the self control subscale of the I-E scale, the Restraint scale, and locus of control, seems to directly tap

subjects belief structure about their lack of self-control or impulsivity. Higher scores reflect greater concern with this dimension, higher restraint over eating behavior, and greater belief in an external locus of control.

In other words, again by chance, the information given to subjects ran directly counter to their pre-existing levels of belief in that very dimension. There is no way of knowing whether this was an important confound in the experiment, but it seems likely that it weakened the effect of the manipulation.

In using such a manipulation, which is likely to affect self-esteem, it is necessary in the first place to walk a fine line between being ineffective, or being too "effective", thus detrimental to the participants, especially with a clinical population. Thus, this confound is, at least, problematic, and should be considered in future studies as a dimension on which it might be important to match subjects.

The second major hypothesis of the study concerned the combined effect of the self-control manipulation plus eating food, on body image measures. In examining the changes in body image distortion following the meal, it seems plausible that whatever effect the manipulation had, it was delayed. The only significant difference, considering the Bonferroni correction, was between restricters and controls receiving negative feedback. Following negative feedback, plus eating a meal, restricters' perception of their body size increased, while that of controls decreased, regardless of feedback. If the Bonferroni

correction is disregarded, a significant difference was found between positive and negative conditions for restricters, such that negative feedback, as noted, resulted in an increase in distortion, while positive feedback resulted in a decrease.

A different pattern occurs in the bulimic group, with a decrease in distortion following positive feedback, relative to no change after negative feedback. This difference did not reach significance, but suggests a differential sensitivity to positive or negative evaluation in these two patient groups, with restricters ignoring positive but responding to negative imformation about themselves, and bulimics responding favorably to positive information, with less reaction to negative information.

While previous studies (Freeman et al., 1980; Garfinkel et al., 1978) found no effect of eating a meal on body image distortion, the current study found that significant changes or trends occurred after the meal, rather than directly following the feedback. This suggests that the self control manipulation exerted an influence, but indirectly. It is proposed that the results be interpreted in terms of a "priming effect" of self control feedback or beliefs.

It is possible that patients with negative information about their effectiveness or self-control approached eating with these beliefs uppermost in their minds, feeling defeated in advance at any attempts to exert self-control.

Restricters receiving negative feedback tended to eat less than those receiving positive feedback. Perhaps negative beliefs or feedback (to which the anorectic individual selectively attends) resulted in her eating more than she wished (the actual amount being inconsequential), lowered self esteem, and increased sensitivity to body size, reflected in greater distortion. Button et al. discussed this "lowered threshold of sensitivity to body changes"(1977), which has been suggested as a possible mechanism for body size overestimation by Slade (1979). This hypothesis received some support from the finding that restricters receiving negative feedback tended to eat less that those receiving positive feedback, i.e. they exercised more restraint, which is just what they must do to maintain or exacerbate their symptoms. After positive feedback, when subjects ate more, their restraint was relaxed, and body image distortion decreased. This was also supported by the negative correlation found between restraint and caloric consumption in restricter and control subjects, compared with a positive correlation for bulimics. It must be emphasized that this interpretation is speculative, and that, as noted, the difference in consumption between eating disorder groups was not significant.

The positive relationship between caloric consumption and restraint in bulimics may simply be reflective of their impulsivity, and their binge/purge cycle. It may be that the greater likelihood of actual lack of control in this group is

accompanied by, or results in, a greater perceived need for control. In fact, as noted by Polivy (1978), restraint scores tend to be higher in bulimic subjects. In the current study, they were slightly higher. They also ate significantly more than anorectics.

The relationships among self esteem and body image were investigated via data reduction by means of a principal components analysis. Along with several self concept scores, level of depression, perfectionism and ineffectiveness from the EDI loaded on the self concept factor.

As expected, the eating disordered subjects scored significantly lower than controls on this factor, with restricter subjects scoring lowest. This suggests that restricters set high standards for themselves (i.e. Perfectionism), which they then feel incapable of fulfilling (i.e. Ineffectiveness). Negative mood is bound to result from this perceived discrepancy. The tendency to perfectionism and a high need for achievement has been reported clinically. Factor 1, the self concept factor, was significantly correlated with Factor 2, comprised of subscales from the EDI, self ratings of assertiveness and confidence, and the variability subscale of the TSCS, reflecting conflict. Factor 2 seems to reflect a dimension of pathology, which would be expected to be correlated with self esteem. Interestingly, the third factor derived from the data reduction (control concerns) was not highly correlated with the other two.

It is not known why the restricters in the current sample are lower in self esteem and higher in general pathology than the bulimics. It is usually reported in the literature (e.g. Casper et al., 1980) that bulimic patients are more seriously disturbed that restricting anorexics, more resistant to treatment, and have a poorer prognosis. It could be that the particular group of restricters referred to Shaughnessy Hospital is somewhat more disturbed than is typically the case. Since Factor 2 was comprised mainly of EDI items, it was expected that restricters and bulimics would score higher than controls, indicating considerably more desire for thinness, dissatisfaction with body weight and size, higher need for perfection, more maturity fears and greater interpersonal distrust.

Control issues were a particular focus of the current study, and it is particularly noteworthy, first, that items reflecting this issue clustered on Factor 3, and second, that it was essentially unrelated to self esteem or eating pathology. Restricters and controls did not differ significantly on this factor, in fact restricters scored the lowest of all groups, suggesting a highly controlled self-presentation. Bulimics scored significantly higher that both restricters and controls, indicating higher bulimia subscale scores, a lower perception of personal self control, higher self criticism, and a greater concern with weight and restraint of eating behavior. Total locus of control scores (external), body dissatisfaction, desire

for thinness, and moral self concept also contribute to this factor. In all, it is suggestive of a high degree of concern and conflict related to self control issues.

When used as a covariate in an analysis of covariance, none of the foregoing factors proves to be a significant covariate of change in body image distortion. However, an examination of the correlation between factor scores and individual body image measures suggests a pattern of relationship for restricters, bulimics and controls. For restricters only, Factor 2, eating pathology (on which restricters scored higher than bulimics) was positively related to body image scores 1 and 2. This was not the case for the remaining subject groups. Re-examining the items on this factor, it appears that the highest loading items, perfectionism, desire for thinness, and body dissatisfaction, are most responsible for this relationship.

The higher scores on factor 3 for bulimics is in part due to the bulimia subscale. This factor is slightly more related to body image scores for bulimics, but negatively, i.e. higher factor 3 scores are related to lower body image distortion. Since the correlation is not significant, it is difficult to interpret, but it is noteworthy that by body image measure 3, the relationship has changed to a positive one (after eating). It is possible that, in bulimic patients with an external, low self control orientation, the effect of eating was to increase their sensitivity to body size, and increase their subjective size perception. The cognitive event responsible for this might

be "Well, I've eaten all that food; I've lost control again; I'm useless and fat".

Given the foregoing, and the finding that body size overestimation did not differ for eating disorder and control subjects, it seems likely that the meaning and the mechanism of this overestimation differs in these individuals. For the eating disorder groups, unlike the women with no eating disorders or weight problems, overestimation is intricately connected with low self esteem and pathological attitudes and behaviors centering around eating behavior. Thus, while some level of inaccuracy of body size perception may be common in women, it seems to interact with other factors, and function differently in restricters and bulimics.

III. Weight Stereotypes: Is Thin Competent?

The results of the present investigation suggest that the hypothesized weight stereotype exists, albeit in a somewhat different form than anticipated. Although the ratings of the apparently different-weight women did not strongly differentiate thin and normal weight, fat or overweight women are viewed as less competent, strong, in control, intelligent, and socially skilled than normal weight or thin women. When all else is equal (appearance, clothing, attractiveness), thinner women are judged more positively on these dimensions than fatter women. This certainly confirms what one might infer from the popular media, television, films, magazines and beauty pageants. It also confirms speculation regarding the connotations of achieving a thin body size. Indeed it appears that body size is seen as a measure of achievement and worth in the sample studied herein. It is interesting to note that bulimics scored lower than controls, with restricters scoring significantly higher than controls (the restricter/control difference approaches significance). In other words, stronger stereotypes regarding thinness are held by anorectic patients. While there seems to be a second stereotype related to greater likeability, warmth and friendliness in thin women, this belief does not appear to vary among groups, being held equally by restricters, bulimics and normal weight controls.

Adherence to a stereotyped belief about thinness and competence did not function as a mediator of the relationship between self control beliefs and body image distortion. However, greater adherence to the stereotype is positively related to a greater degree of body image distortion for restricting patients. The more they believe in the positive value and rewards associated with being thin, the more distorted their perceptions of their body size.

This concurs with the relationship noted above regarding the correlation between eating pathology and body image distortion. The more the anorectic patient adheres to the stereotype, the more dissatisfied she is with her body size, the thinner she wishes to be, and the fatter she sees herself.

IV. Directions for Future Reseach

Bruch (1978) has noted the importance of understanding the anorexic's cognitive interpretation of events. The current study raises some questions about the relationship among self-esteem, self control beliefs, body image and eating behavior in anorexics. In bulimics, the battle for control, and in restricters the demonstration of and need to maintain control seem to be closely related to other features of the disorder. It is proposed that these beliefs or fears play a maintaining role in the illness.

Garner and Bemis (1982) have recently outlined a cognitive intervention approach to treatment of eating disorder patients. They note a number of common cognitive distortions, including all-or-none thinking, overgeneralization, and an over-emphasis on body image and self control as indicators of self worth. Further detailed research is needed on these areas. Also, as a continuation of the current study, research is needed to identify the specific events and beliefs in the lives of eating disorder patients which trigger feelings of loss of control, and dieting or bingeing/vomiting cycles.

The current findings point to the importance of addressing issues of self-esteem and self-control in intervention programs. Also, it is importat to encourage patients to critically examine the validity of popular stereotypes about being thin, and

attempt to discover other means of achieving a healthy self image. Exploration of other avenues to self worth might revolve around realistically evaluating interests, aptitudes and abilities, identifying strengths, and setting goals accordingly.

A previous study (Garfinkel et al., 1978) found that viewing one's image in a mirror did not alter body size estimation in anorexics. However, the viewing was for only 10 seconds, and the current research suggests that viewing of one's image in a video monitor might be a useful meas of improving body image perception, noted by Bruch to be a critical precursor of recovery in anorexia nervosa. In general, restricters and bulimics tend to avoid mirrors, and often cover their bodies in loose fitting clothing. It would be interesting to investigate whether repeated viewing of their own image, accompanied by "cognitive restructuring" strategies, could result in more accurate self-perception.

In conclusion, it is probably most informative to view the current study as exploratory. It has served to raise more questions for the researcher, rather than giving definitive answers, which in any case, are elusive in the field of eating disorders. If the results herein contribute in some small way to our theoretical and practical knowledge of anorexia and bulimia nervosa, then the researcher's goal has been accomplished.

E. Appendices

Personality and Body Image

This study is designed to help us learn more about the relationship between certain attitudes and beliefs people hold about themselves and others, and some personality characteristics. We are also interested in how these factors are related to your body image, and thus will be measuring your body image as part of the procedure. These measures will require that you wear a leotard, which will be provided.

There are no right or wrong answers to the questions or ratings asked of you, so please answer as you really believe. Your personal responses or scores on any tests will remain completely confidential at all times, since we are interested in how people respond on the average, rather than in individual beliefs or attitudes. Approximately two hours of your time will be required; one hour to complete the necessary questionnaires (at home) and one hour in the lab to complete the body image measures and discuss the questionnaire results.

Since we ask that you refrain from eating after 8:00 p.m. the evening before, will be providing a lunch. As part of the procedure we would like you to eat some lunch, but want you to feel free to eat as little or as much as you are comfortable with.

Consent Form

Having been asked by Patricia Hyatt of the Psychology Department of Simon Fraser University to participate in the research project, "Personality and Body Image", I understand the procedures to be used in the study, and I understand that the procedures may be terminated at any time, at my request, without affecting any on-going treatment program. I also understand that I may register any complaint I might have about the study with the researcher named above, or with Roger Blackman, Chairman of the Psychology Department, Simon Fraser University. I may obtain a copy of the results of this study, upon its completion, by contacting Patricia Hyatt.

I agree to participate in the procedures outlined in the above description of the study, during the period June, 1983 to June, 1984.

Shaughnessy Hospital / Simon Fraser University

DATE _____

NAME _____ SIGNATURE _____

WITNESS _____

(please remove one copy and retain for your information, sign and leave the remaining copy in the booklet).

EDI

I.D._____

Age_____

Present Weight: _____ Height: _____

Highest Past Weight
(excluding pregnancy): _____lbs.

How long ago? _____months

How long did you weigh this? _____months

Lowest Past Adult Weight: _____lbs.

How long ago? _____months

How long did you weigh this? _____months

What do you consider your ideal weight? _____lbs.

Age at which weight problem began (if any) _____

Father's occupation _____

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 to try very hard to be completely honest in your answers. Results are completely confidential. Read each question and place an (X) under the column which applies best for you. Please answer each question very carefully. Thank you.

Always	Usually	Often	Sometimes	Rarely	Never		
( )	( )	( )	( )	( )	( )	1.	I eat sweets and carbohydrates without feeling nervous.
( )	( )	( )	( )	( )	( )	2.	I think that my stomach is too big.
( )	( )	( )	( )	( )	( )	3.	I wish that I could return to the security of childhood.
( )	( )	( )	( )	( )	( )	4.	I eat when I am upset.
( )	( )	( )	( )	( )	( )	5.	I stuff myself with food.
( )	( )	( )	( )	( )	( )	6.	I wish that I could be younger.
( )	( )	( )	( )	( )	( )	7.	I think about dieting.
( )	( )	( )	( )	( )	( )	8.	I get frightened when my feelings are too strong.
( )	( )	( )	( )	( )	( )	9.	I think that my thighs are too large.
( )	( )	( )	( )	( )	( )	10.	I feel ineffective as a person.
( )	( )	( )	( )	( )	( )	11.	I feel extremely guilty after overeating.
( )	( )	( )	( )	( )	( )	12.	I think that my stomach is just the right size.
( )	( )	( )	( )	( )	( )	13.	Only outstanding performance is good enough in my family.
( )	( )	( )	( )	( )	( )	14.	The happiest time in life is when you are a child.
( )	( )	( )	( )	( )	( )	15.	I am open about my feelings.
( )	( )	( )	( )	( )	( )	16.	I am terrified of gaining weight.
( )	( )	( )	( )	( )	( )	17.	I trust others.
( )	( )	( )	( )	( )	( )	18.	I feel alone in the world.
( )	( )	( )	( )	( )	( )	19.	I feel satisfied with the shape of my body.
( )	( )	( )	( )	( )	( )	20.	I feel generally in control of things in my life.
( )	( )	( )	( )	( )	( )	21.	I get confused about what emotion I am feeling.
( )	( )	( )	( )	( )	( )	22.	I would rather be an adult than a child.

Always	Usually	Often	Sometimes	Rarely	Never		
( )	( )	( )	( )	( )	( )	23.	I can communicate with others easily.
( )	( )	( )	( )	( )	( )	24.	I wish I were someone else.
( )	( )	( )	( )	( )	( )	25.	I exaggerate or magnify the importance of weight.
( )	( )	( )	( )	( )	( )	26.	I can clearly identify what emotion I am feeling.
( )	( )	( )	( )	( )	( )	27.	I feel inadequate.
( )	( )	( )	( )	( )	( )	28.	I have gone on eating binges where I have felt that I could not stop.
( )	( )	( )	( )	( )	( )	29.	As a child, I tried very hard to avoid disappointing my parents and teachers.
( )	( )	( )	( )	( )	( )	30.	I have close relationships.
( )	( )	( )	( )	( )	( )	31.	I like the shape of my buttocks.
( )	( )	( )	( )	( )	( )	32.	I am preoccupied with the desire to be thinner.
( )	( )	( )	( )	( )	( )	33.	I don't know what's going on inside me.
( )	( )	( )	( )	( )	( )	34.	I have trouble expressing my emotions to others.
( )	( )	( )	( )	( )	( )	35.	The demands of adulthood are too great.
( )	( )	( )	( )	( )	( )	36.	I hate being less than best at things.
( )	( )	( )	( )	( )	( )	37.	I feel secure about myself.
( )	( )	( )	( )	( )	( )	38.	I think about bingeing (over-eating).
( )	( )	( )	( )	( )	( )	39.	I feel happy that I am not a child anymore.
( )	( )	( )	( )	( )	( )	40.	I get confused as to whether or not I am hungry.
( )	( )	( )	( )	( )	( )	41.	I have a low opinion of myself.
( )	( )	( )	( )	( )	( )	42.	I feel that I can achieve my standards.
( )	( )	( )	( )	( )	( )	43.	My parents have expected excellence of me.
( )	( )	( )	( )	( )	( )	44.	I worry that my feelings will get out of control.

Always	Usually	Often	Sometimes	Rarely	Never		
( )	( )	( )	( )	( )	( )	45.	I think that my hips are too big.
( )	( )	( )	( )	( )	( )	46.	I eat moderately in front of others and stuff myself when they're gone.
( )	( )	( )	( )	( )	( )	47.	I feel bloated after eating a normal meal.
( )	( )	( )	( )	( )	( )	48.	I feel that people are happiest when they are children.
( )	( )	( )	( )	( )	( )	49.	If I gain a pound, I worry that I will keep gaining.
( )	( )	( )	( )	( )	( )	50.	I feel that I am a worthwhile person.
( )	( )	( )	( )	( )	( )	51.	When I am upset, I don't know if I am sad, frightened or angry.
( )	( )	( )	( )	( )	( )	52.	I feel that I must do things perfectly, or not do them at all.
( )	( )	( )	( )	( )	( )	53.	I have the thought of trying to vomit in order to lose weight.
( )	( )	( )	( )	( )	( )	54.	I need to keep people at a certain distance (feel uncomfortable if someone tries to get too close).
( )	( )	( )	( )	( )	( )	55.	I think that my thighs are just the right size.
( )	( )	( )	( )	( )	( )	56.	I feel empty inside.
( )	( )	( )	( )	( )	( )	57.	I can talk about personal thoughts or feelings.
( )	( )	( )	( )	( )	( )	58.	The best years of your life are when you become an adult.
( )	( )	( )	( )	( )	( )	59.	I think that my buttocks are too large.
( )	( )	( )	( )	( )	( )	60.	I have feelings I can't quite identify.
( )	( )	( )	( )	( )	( )	61.	I eat or drink in secrecy.
( )	( )	( )	( )	( )	( )	62.	I think that my hips are just the right size.
( )	( )	( )	( )	( )	( )	63.	I have extremely high goals.
( )	( )	( )	( )	( )	( )	64.	When I am upset, I worry that I will start eating.

Beck Inventory

On this questionnaire are groups of statements. Please read each group of statements carefully. Then pick out the one statement in each group which best describes the way you have been feeling the PAST WEEK, INCLUDING TODAY. Circle the number beside the statement you picked. If several statements in the group seem to apply equally well, circle each one. Be sure to read all the statements in each group before making your choice.

1.0 I do not feel sad.
1 I feel sad.
2 I am sad all the time and I can't snap out of it.
3 I am so sad or unhappy that I can't stand it.

2.0 I am not particularly discouraged about the future.
1 I feel discouraged about the future.
2 I feel I have nothing to look forward to.
3 I feel that the future is hopeless and that things cannot improve.

3.0 I do not feel like a failure.
1 I feel I have failed more than the average person.
2 As I look back on my life, all I can see is a lot of failure.
3 I feel I am a complete failure as a person.

4.0 I get as much satisfaction out of things as I used to.
1 I don't enjoy things the way I used to.
2 I don't get real satisfaction out of anything anymore.
3 I am dissatisfied or bored with everything.

5.0 I don't feel particularly guilty.
1 I feel guilty a good part of the time.
2 I feel quite guilty most of the time.
3 I feel guilty all of the time.

6.0 I don't feel I am being punished.
1 I feel I may be punished.
2 I expect to be punished.
3 I feel I am being punished.

7.0 I don't feel disappointed in myself.
1 I am disappointed in myself.
2 I am disgusted with myself.
3 I hate myself.

8.0 I don't feel any worse than anybody else.
1 I am critical of myself for my weaknesses or mistakes.
2 I blame myself all the time for my faults.
3 I blame myself for everything bad that happens.

9.0 I don't have any thoughts of killing myself.
1 I have thoughts of killing myself, but I would not carry them out.
2 I would like to kill myself.
3 I would kill myself if I had the chance.

10.0 I don't cry any more than usual.
1 I cry more now than I used to.
2 I cry all the time now.
3 I used to be able to cry, but now I can't even though I want to.

11.0 I am no more irritated now than I ever was.
1 I get annoyed or irritated more easily than I used to.
2 I feel irritated all the time now.
3 I don't get irritated at all by the things that used to irritate me.

12.0 I have not lost interest in other people.
1 I am less interested in other people than I used to be.
2 I have lost most of my interest in other people.
3 I have lost all of my interest in other people.

13.0 I make decisions about as well as I ever could.
1 I put off making decisions more than I used to.
2 I have greater difficulty in making decisions than before.
3 I can't make decisions at all any more.

14.0 I don't feel I look any worse than I used to.
1 I am worried that I am looking old or unattractive.
2 I feel that there are permanent changes in my appearance that make me look unattractive.
3 I believe that I look ugly.

15.0 I can work about as well as before.
1 It takes an extra effort to get started at doing something.
2 I have to push myself very hard to do anything.
3 I can't do any work at all.

16.0 I can sleep as well as usual.
1 I don't sleep as well as I used to.
2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
3 I wake up several hours earlier than I used to and cannot get back to sleep.

17.0 I don't get more tired than usual.
1 I get tired more easily than I used to.
2 I get tired from doing almost anything.
3 I am too tired to do anything.

18.0 My appetite is no worse than usual.
1 My appetite is not as good as it used to be.
2 My appetite is much worse now.
3 I have no appetite at all anymore.

19.0 I haven't lost much weight, if any lately.
1 I have lost more than 5 pounds.
2 I have lost more than 10 pounds.
3 I have lost more than 15 pounds.
4 I am purposely trying to lose weight by eating less.
Yes _____ No _____

20.0 I am no more worried about my health than usual.
1 I am worried about physical problems such as aches and pains, or upset stomach, or constipation.
2 I am very worried about physical problems and it's hard to think of much else.
3 I am so worried about my physical problems that I cannot think about anything else.

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

Personal Beliefs Inventory

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

Please answer these items carefully but do not spend too much time on any one item. Be sure to find an answer for every choice. Circle the a or b beside the one you choose as the statement more true.

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

1.(a) Children get into trouble because their parents punish them too much.
(b) The trouble with most children nowadays is that their parents are too easy with them.

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

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

4.(a) Even when there was nothing forcing me, I have found that I will sometimes do things I really did not want to do.
(b) I always feel in control of what I am doing.

5.(a) In the long run people get the respect they deserve in this world.
(b) Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.

6.(a) The idea that teachers are unfair to students is nonsense.
(b) Most students don't realize the extent to which their grades are influenced by accidental happenings.

7.(a) Without the right breaks one cannot be an effective leader.
(b) Capable people who fail to become leaders have not taken advantage of their opportunities.

8.(a) Sometimes I impulsively do things which at other times I definitely would not let myself do.
(b) I find that I can keep my impulses in control.

9.(a) No matter how hard you try some people just don't like you.
(b) People who can't get others to like them just don't understand how to get along with others.

10.(a) Heredity plays the major role in determining personality.
(b) It is one's experiences in life which determine what they're like.

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

12.(a) When I put my mind to it I can constrain my emotions.
(b) There are moments when I cannot subdue my emotions and keep them in check.

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

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

15.(a) The average citizen can have an influence in government decisions.
(b) This world is run by the few people in power, and there is not much the little guy can do about it.

16.(a) People cannot always hold back their personal desires; they will behave out of impulse.
(b) If they want to, people can always control their immediate wishes, and not let these motives determine their total behavior.

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

18.(a) There are certain people who are just no good.
(b) There is some good in everybody.

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

20.(a) Although sometimes it is difficult, I can always wilfully restrain my immediate behavior.
(b) Something I cannot do is have complete mastery over all my behavioral tendencies.

21.(a) Who gets to be the boss often depends on who was lucky enough to be in the right place first.
(b) Getting people to do the right thing depends upon ability, luck has little or nothing to do with it.

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

23.(a) Most people don't realize the extent to which their lives are controlled by accidental happenings.
(b) There really is no such thing as "luck".

24.(a) It is possible for me to behave in a manner very different from the way I would want to behave.
(b) It would be very difficult for me to not have mastery over the way I behave.

25.(a) One should always be willing to admit mistakes.
(b) It is usually best to cover up one's mistakes.

26.(a) It is hard to know whether or not a person really likes you.
(b) How many friends you have depends upon how nice a person you are.

27.(a) In the long run the bad things that happen to us are balanced by the good ones.
(b) Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.

28.(a) Self-regulation of one's behavior is always possible.
(b) I frequently find that when certain things happen to me I cannot restrain my reaction.

29.(a) With enough effort we can wipe out political corruption.
(b) It is difficult for people to have much control over the things politicians do in office.

30.(a) Sometimes I can't understand how teachers arrive at the grades they give.
(b) There is a direct connection between how hard I study and the grades I get.

31.(a) A good leader expects people to decide for themselves what they should do.
(b) A good leader makes it clear to everybody what their jobs are.

32.(a) When I make my mind up, I can always resist temptation and keep control of my behavior.
(b) Even if I try not to submit, I often find I cannot control myself from some of the enticements in life such as over-eating or drinking.

33.(a) Many times I feel that I have little influence over the things that happen to me.
(b) It is impossible for me to believe that chance or luck plays an important role in my life.

34.(a) People are lonely because they don't try to be friendly.
(b) There's not much use in trying too hard to please people, if they like you, they like you.

35.(a) There is too much emphasis on athletics in high school.
(b) Team sports are an excellent way to build character.

36.(a) What happens to me is my own doing.
(b) Sometimes I feel that I don't have enough control over the direction my life is taking.

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

Eating Habits Questionnaire

Circle one answer for each question.

1. How often are you dieting?
   Never Rarely Sometimes Usually Always

2. What is the maximum amount of weight (in pounds) you have ever lost within one month?
   0-4 5-9 10-14 15-19 20+

3. What is your maximum weight gain within a week?
   0-1 1.1-2 2.1-3 3.1-5 5.1+

4. In a typical week, how much does your weight fluctuate?
   0-1 1.1-2 2.1-3 3.1-5 5.1+

5. Would a weight fluctuation of 5 lb. affect the way you live your life?
   Not at all Slightly Moderately Very much

6. Do you eat sensibly in front of others and splurge alone?
   Never Rarely Often Always

7. Do you give too much time and thought to food?
   Never Rarely Often Always

8. Do you have feelings of guilt after overeating?
   Never Rarely Often Always

9. How conscious are you of what you're eating?
   Not at all Slightly Moderately Extremely

10. How many pounds over your desired weight were you at your maximum weight?
    0-1 1-5 6-10 11-20 21+

Self-Appraisal Questionnaire

The following items ask about what kind of person you think you are. Each item consists of a pair of characteristics, with the numbers 1 to 10 in between. For example:

Not at all Friendly	1	2	3	4	5	6	7	8	9	10	Very Friendly

Just circle the number, from 1 to 10, that you think best describes you. We will be discussing the accuracy of your your self-perceptions later, so please take your time in considering your ratings.

Not at all Competent	1	2	3	4	5	6	7	8	9	10	Very Competent
Not at all Assertive	1	2	3	4	5	6	7	8	9	10	Very Assertive
Not at all Confident	1	2	3	4	5	6	7	8	9	10	Very Confident
Not at all In Control	1	2	3	4	5	6	7	8	9	10	Very much In Control
Not at all Socially Skilled	1	2	3	4	5	6	7	8	9	10	Very Socially Skilled

Person Perception Scale

We are trying to find out how people's attitudes and beliefs about other people go together. This kind of research is sometimes referred to as person perception, that is, how we learn to perceive others.

We would like you to look at each of the photographs in this package, and rate each individual on the characterstics listed. There is a separate set of scales for each photograph.

Don't worry or think too much about why you have a particular feeling or reaction - it's strictly subjective, with no right or wrong answers. We would just like your initial reaction.

Photograph A

Circle the appropriate number:

unassertive	1....2....3....4....5	assertive
incompetent	1....2....3....4....5	competent
unhappy	1....2....3....4....5	happy
cold	1....2....3....4....5	warm
not in control	1....2....3....4....5	in control
unattractive	1....2....3....4....5	attractive
unintelligent	1....2....3....4....5	intelligent
unfriendly	1....2....3....4....5	friendly
not socially poised	1....2....3....4....5	socially poised
weak	1....2....3....4....5	strong
unlikeable	1....2....3....4....5	likeable
not self-confident	1....2....3....4....5	self-confident

Photograph B

Circle the appropriate number:

unassertive	1....2....3....4....5	assertive
incompetent	1....2....3....4....5	competent
unhappy	1....2....3....4....5	happy
cold	1....2....3....4....5	warm
not in control	1....2....3....4....5	in control
unattractive	1....2....3....4....5	attractive
unintelligent	1....2....3....4....5	intelligent
unfriendly	1....2....3....4....5	friendly
not socially poised	1....2....3....4....5	socially poised
weak	1....2....3....4....5	strong
unlikeable	1....2....3....4....5	likeable
not self-confident	1....2....3....4....5	self-confident

Photograph C

Circle the appropriate number:

unassertive	1....2....3....4....5	assertive
incompetent	1....2....3....4....5	competent
unhappy	1....2....3....4....5	happy
cold	1....2....3....4....5	warm
not in control	1....2....3....4....5	in control
unattractive	1....2....3....4....5	attractive
unintelligent	1....2....3....4....5	intelligent
unfriendly	1....2....3....4....5	friendly
not socially poised	1....2....3....4....5	socially poised
weak	1....2....3....4....5	strong
unlikeable	1....2....3....4....5	likeable
not self-confident	1....2....3....4....5	self-confident

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