

Body Image Perception and Self-Esteem in
Eating Disordered Females: Further Validation of the
Silhouette Body Image Test

K. Jennifer Helm, B.A. ©

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Abstract

Previous research has shown that the available techniques for assessing body image perception do not provide valid and reliable measures. The present study was designed to further validate the Silhouette Body Image Test (SBIT), which was found to be a reliable and valid measure of body image perception on a population of non-eating disordered university students. In the present study, a sample of anorexics, bulimics and non-eating disordered females were administered the SBIT. Responses on the SBIT were compared to subject's actual body size. Results indicated that eating disordered females significantly overestimated their body size when compared to non-eating disordered controls. Subjects level of self-esteem was measured with the Rosenberg Self-Esteem Scale (RSE) to examine the relationship between self-esteem and body image distortion. Eating disordered females scored significantly lower in level of self-esteem. Results indicated a significant negative correlation between low self-esteem and percent of overestimation of body size for all subjects. Implications and suggestions for future research are discussed.

Introduction

An important step during the developmental process of childhood is the perception of an integrated and organized physical structure called one's body image (Feshback & Weiner, 1982). Body image refers to the mental image one has of the physical appearance of one's body (Glucksman, 1972), including the attitudes and feelings of the individual towards her/his body (Gray, 1977). Schilder (cited in Bruch, 1973) describes body image as "the picture of our body that we form in our mind, that is to say, the way in which the body appears to ourselves" (p.87). Studies of body image have investigated such variables as body anxiety, body dissatisfaction, plasticity of body scheme, preferred body proportions, position of body image in space, and concept of body size (McCrea, Summerfield & Rosen, 1982). For the purpose of this study, body image refers to the individual's perception of body size.

Ideally there should not be a discrepancy between an individual's actual body size and their body image. Body image distortion, however, is not an uncommon phenomenon with many individuals in our society. The concern about obesity and the belief that being beautiful means being thin, may be contributing factors to these distortions in body image (Gross, 1982). Since World War II, western culture has stressed appearances. Hsu (1983) believes, that in the female, this importance of physical attractiveness has taken

the form of thinness. This phenomenon has been demonstrated through advertising, television, and the large numbers of diet and fitness books on best seller lists (Gross, 1982).

Over the last 20 years, a thinner standard of bodily attractiveness for women has emerged. Garner, Garfinkel, Schwartz and Thompson (1980) found empirical support for this shift in body size by examining Miss America contestants and Playboy centerfolds between 1959 and 1978. They found that over the years, these women became increasingly thinner. For example, Playboy centerfolds in 1959 weighed approximately 91% of average weight, whereas in 1978, they weighed 83.5% of average. Furthermore, Garner et al. (1980) found that this decrease in body size was occurring at a time when the general population was becoming heavier. Metropolitan Life Insurance Company (1983) reports an increase in the average weight, for all heights, of women under the age of 30, over the last 20 years. This increasingly thinner standard of attractiveness was further supported by the work of Silverstein, Peterson and Perdue (1986) who examined the body sizes of models appearing in Vogue and Ladies Home Journal magazines between 1901 and 1981. The authors found that there were two periods where women became increasingly noncurvaceous. Body sizes steadily decreased from 1917 to 1925, at which point they increased again until approximately 1960. From this point on, body sizes for women have continued to decrease and be noncurvaceous. Garner et al.

(1980) also found that there was an increase in the attention paid to eating disorders after 1960. This was measured by an increase in the number of diet articles run in women's magazines from 1960 onwards. Silverstein et al. (1986) concluded that when the standard of bodily attractiveness becomes increasingly thinner, the number of women who develop eating disorders increases.

Body image studies have been of interest to researchers for many years, but have only become a concern in the study of eating disorders during the last few decades (Garner, Garfinkel & Moldofsky, 1978). Two of these disorders, anorexia nervosa and bulimia nervosa, are of particular interest to studies of body image perception. Anorexia nervosa occurs most often in adolescent females (Bryant & Bates, 1985; Provenzale, 1983; Humphries, Wrobel & Weingart, 1982; Crisp, 1980 & Bemis, 1978), however, there have been numerous reports of onset prior to puberty (Tolstrup, 1982) and later in adulthood (Hsu, 1983 & Tolstrup, 1982). Estimates of incidence range from 1 per 100 (Crisp, 1980) to 1 per 250 (Provenzale, 1983). The DSM-III (1980) classifies anorexia nervosa as an eating disorder that is usually present prior to adulthood and suggests the following diagnostic criteria:

- 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).

The incidence of bulimia nervosa is much less clear due to the secretive nature of the disorder, however, occurrence of this disorder does appear to have an alarmingly high rate (Johnson & Berndt, 1983). Estimates for college populations range from 3.9% to 19%, with approximately 85% female (Katzman, Wolchick, Braver, 1984; Pyle, Mitchell, Eckert, Halvorson, Neuman & Goff, 1983 & Halmi, Falk & Schwartz, 1981). The average age range for bulimia is early to mid 20s, with the age of onset at approximately 18 years of age (Johnson, Lewis & Hagman, 1984 & Johnson & Berndt, 1983). The DSM-III (1980) classifies bulimia as an eating disorder with a chronic, remitting course and suggests the following diagnostic criteria:

A. Recurrent episodes of binge eating (rapid consumption of a large amount of food in a discrete period of time, usually less than two hours).

B. At least three of the following:

1. consumption of high caloric, easily ingested food during a binge.

2. inconspicuous eating during a binge.

3. termination of such eating episodes by abdominal pain, sleep, social interruption, or self-induced vomiting.

4. repeated attempts to lose weight by severely restrictive diets, self-induced vomiting, or use of cathartics or diuretics.

5. frequent weight fluctuations greater than 10 pounds due to alternating binges and fasts.

C. Awareness that the eating pattern is abnormal and fear of not being able to stop eating voluntarily.

D. Depressed mood and self-deprecating thoughts following eating binges.

E. The bulimic episodes are not due to Anorexia Nervosa or any known physical illness (p.70).

Bruch (1973) argues that "a disturbance of delusional proportions in the body image and body concept" (p.251) is an essential criterion for the diagnosis of anorexia nervosa. Body image distortion in anorexia nervosa has received so much attention over the last decade that numerous review articles have been written in an attempt to integrate the material (Slade, 1985; Garner, 1981 & Garner & Garfinkel, 1981-82). Many studies have shown that anorexics significantly overestimate their body size unlike normal controls (Bell, Kirpatrick & Rinn, 1986; Touyz, Beaumont, Collins, McCabe & Jupp, 1984; Buvat-Herbaut, Hebbinckuys, Lemaire & Buvat, 1983; Casper, Offer & Ostrov, 1981; Strober, 1981; Garfinkel, Moldofsky & Garner, 1979; Garfinkel, Moldofsky, Garner, Stancer & Coscina, 1978; Pierloot & Houben, 1978; Slade & Russel, 1973a & Slade & Russell, 1973b). Unfortunately, there are just as many studies that found the anorexic's overestimation to be no different than

that of normal controls (Thompson, 1987; Huon & Brown, 1986; Thompson, Berland, Linton & Weinseir, 1986; Norris, 1984; Ben-Tovim & Crisp, 1984; Strober, Goldenberg, Green & Saxon, 1979; Casper, Halmi, Goldberg, Eckert & Davis, 1979; Button, Fransella & Slade, 1977; Garner, Garfinkel, Stancer & Moldofsky, 1976 & Crisp & Klaucy, 1974). As can be noted by examining the two sets of studies, many of the authors who found significant differences in one study, failed to find significant differences in other studies.

Fairburn and Garner (1986) suggest that the bulimics disturbed attitude towards body shape and weight are a fundamentally core feature of this disorder. Fairburn, Cooper & Cooper (1986) identified four psychopathological features of bulimics attitudes towards body shape and weight: a morbid fear of fatness, sensitivity to weight gain, a pathological pursuit of thinness and body image distortion. Fairburn et al. (1986) found that from a sample of bulimics, approximately 86% experienced a morbid fear of fatness, 55% exhibited sensitivity to weight gain, 23% pursued thinness and 29% were found to have a distorted body image. Fairburn and Garner (1986) argue that these attitudes to shape and weight have diagnostic significance and may also be of primary importance to the maintenance of both bulimia nervosa and anorexia nervosa.

Although body image distortion in bulimia has seen some attention in the literature, the studies to date are far less

numerous than that seen in the anorexic literature. Body size overestimation was once thought to be specific to anorexia nervosa, but recent studies have shown the bulimic's overestimation of body size to be much the same as that seen with anorexic patients (Thompson et al., 1986 & Touyz, Beaumont, Collins & Cowie, 1985). It has also been found that normal weight bulimics significantly overestimate body size when compared with a normal weight control group (Willmuth, Leitenberg, Rosen, Fondacaro & Gross, 1985).

From the proceeding work on body image distortion in anorexia nervosa and bulimia nervosa, it is obvious that there is disagreement as to whether distortion of body image is specific to these disorders. Many studies have shown that other populations overestimate body size similar to that seen in eating disordered populations, for example, adolescent females (Halmi, Goldberg & Cunningham, 1977), ballet pupils (Lowenkopf & Vincent, 1982) and gymnastic students (Meermann, 1983). There are many differences between studies however, much to the same degree as that seen in the eating disorder literature. Using college undergraduates, Gray (1977) found that females overestimated their body size, whereas males tended to underestimate. Birtchnell, Dolan and Lacey (1987) found that the normal weight females overestimated their body size to a lesser degree than females who were below or above weight. These authors suggested that overestimation of body size is related more to a deviation from normal weight than

the presence or absence of an eating disorder. In contrast to this, Klesges (1983) found that overweight males and females significantly underestimated their body size and the normal and underweight females significantly overestimated their body size. Finally, Slade (1977) found that pregnant women overestimated their body size at four months, but when re-tested at eight months, this overestimation had significantly reduced.

It has been suggested that the reason for these contradictory findings are conceptualization differences from study to study, different assessment methods, and inadequate use of control groups (Klesges, 1983). From studies on anorexia nervosa and bulimia nervosa, Strober (1981) argued that these findings were also the result of differences in duration or stage of illness, heterogeneity in age, prior treatment experiences, and a preponderance of chronically ill patients. Finally, McCrea et al. (1982) suggested that the available techniques and instruments may not provide adequate measures of body image perception. A brief description of some of the more frequently administered measurement techniques follows.

Questionnaires are commonly used in body image studies. Gray (1977) investigated the perception of normalcy of weight and body affect in college undergraduates. Her questionnaire had 10 statements concerning body affect to which subjects were required to indicate on a scale from 1-5 whether they

agree or disagree with the statement. The Fisher Body Distortion Questionnaire (BDQ) (Fisher, 1970) is a self report questionnaire which assesses body image aberration and function. It is made up of 82 questions to which subjects respond on a yes-no-undecided basis. In a recent study, Strober (1981) found a small but significant degree of intercorrelation ($r=.39$, $p<.01$) between the BDQ and the Distorting Photograph Technique (DPT). The DPT requires subjects to adjust the size of their image from a photograph projected on a screen in front of them. This technique will be described in more detail further on. These questionnaires and others often measure body affect and dissatisfaction, and do not measure directly subjects perception of actual body size.

The "draw-a-person" test involves having subjects draw a human figure which is representative of their body image. This test rests on the assumption that subjects drawings of the human figure are representations of their own body image (McCrea et al., 1982). Silverstein and Robinson (1956) argued that this one-to-one relationship did not seem to exist. Furthermore, it has been argued that the differences in subjects proficiency in drawing would be a confounding factor (Woods & Cook, 1954). Brown and Goitein (1943) modified the "draw-a-person" test by having subjects draw a mental picture of themselves while blindfolded. They argued that this blindfold method decreased the effects of subjects

artistic abilities, however, this has not been shown.

Dillon (1962) devised a test for the direct measurement of body size perception. The apparatus is made of one horizontal and two vertical wooden beams which form a doorway. The right vertical beam is fixed and the left vertical and horizontal beams are adjustable. Subjects are required to adjust the two movable beams, from a distance, to form a doorway that is a size they perceive they could just fit through. A similar device, the visual size estimation apparatus, known also as the caliper device, utilizes two lights fixed to a horizontal bar. One light is adjustable in its distance from the second light (Slade & Russell, 1973). In a darkened room, subjects are instructed to estimate the width of various body regions by adjusting the distance between the two lights. McCrea et al. (1982) suggest that this method may not be as sensitive to perceptions and feelings about overall appearance, because the device does not involve having subjects make judgments from their actual appearance. Pierloot and Houben (1978) attempted to correct this problem by repeating the procedure in a modified way. They provided a little light in the darkened room and placed a mirror just to the left of the apparatus, allowing subjects to see themselves while making their judgments. They found a reduction in subjects tendency to overestimate in the modified method, but this tendency did not differ significantly from the original procedure.

The final group of methods used most frequently in body image studies have been the distortion techniques. Schneiderman (1956) developed a technique which detects distortions in mirror images. The mirror is made of a flexible sheet of Plexiglass which can be curved in such a way as to produce 13 different distortion settings. Subjects were required to stand in front of the mirror, which had previously been distorted maximally in the direction of thinness or fatness, and were instructed to adjust the mirror so that the image looks exactly as they see themselves. Studies employing this technique report that normal individuals are extremely vague concerning their mirror images, even when provided with unlimited experience. It has also been argued that body image "involves a recall of the relation of body parts rather than recognition of the body" (McCrea et al., 1982, p.229). In addition, it has been argued that this procedure is cumbersome, time consuming and difficult to quantify (Freeman, Thomas, Solyom & Hunter, 1984).

More recently, videotape recordings have been used to investigate body image perception. Allebeck, Hallberg and Espmark (1976) modified a television monitor allowing for adjustment in the size, height, and weight proportions of the picture. The subject's facial image was presented in a distorted form on the screen and she/he was then instructed to adjust the image to an accurate representation of their

own facial size. The range of possible distortion was limited to a maximum of 15%. The deviation from subjects actual facial size was read directly by means of an electronic device. Freeman et al. (1984) improved on this procedure by modifying a video camera which permitted distortions from 20% thinner to 40% fatter of full body sizes. Whereas the original procedure appeared to produce undesirable distortions, these authors argued that the modified video camera distorts the size of the image without distorting the quality of the image.

The Distorting Photograph Technique (DPT) consists of a variable anamorphic lens which is capable of distorting a photograph along the horizontal axis anywhere from 20% thinner to 20% fatter than its actual size (Glucksman & Hirsch, 1969). This technique requires a photograph of the subject in a two-piece bathing suit. The photograph is converted into a 2 x 2 in. slide which is then projected on a screen in front of the subject. Subjects are usually given four trials, two of which are initially distorted in the direction of maximal fatness and two in the direction of maximal thinness. Subjects are instructed to adjust the image so that it looks exactly as they see themselves (Garner et al., 1976). The amount of distortion in either direction is measured directly from a dial, consisting of 10 equal units, attached to the anamorphic lens. This dial was kept out of view from the subjects. The DPT appears to be a more

sensitive measure of an individual's perception of body size (McCrea et al., 1982). Although the DPT appears to be a reliable and valid method for assessing perceived body size, at present, only one such apparatus exists. The original DPT was made by Kodak in Rochester, N.Y. and they are unable to produce more anamorphic lenses (personal communication, February, 1985). This prevents its use by many researchers and, in fact, in recent years has only been employed by Garner, Garfinkel and associates. Furthermore, should it be possible to produce more, this apparatus is expensive, cumbersome and requires a lot of time on the part of the subject.

Two remaining studies of body image, which use silhouettes as the measurement technique, are important to the present work. Hunt and Weber (1960) devised the Body Image Projective Test which consists of 80 female silhouettes of various heights and contours averaging from 5'1" to 5'9" in height, with thin, average and thick body contours. Their test was administered in the form of a book in which each page contained four randomly assigned silhouettes. For each page, subjects were asked to answer the following questions: "What looks most like me?", "What I would least like to look like?", and "What I would most like to look like?" (p.5). No attempt was made to test the objectivity of the test results because the purpose of the study was to investigate what subjects thought about their body image rather than the

accuracy of their body image.

In a recent study on the genetics of obesity and thinness, Stunkard, Sorensen and Schulsinger (1983) validated a silhouette presentation method for determining body size. Subjects were presented with nine female and nine male silhouettes on a continuum and requested to identify the silhouette which most resembled their parents body sizes. The subjects choices were compared to medical records of the deceased parents and the authors found that subjects were accurate in identifying the actual body sizes. Subjects were not tested in their ability to identify their own body size however, which leaves questions as to whether this is a valid and reliable method for use in body image perception studies.

The proceeding discussion illustrates the difficulties encountered with many of the body image perception measures. Those instruments found to be reliable and valid are also expensive, inaccessible, cumbersome and time consuming. The present study sought to further validate the Silhouette Body Image Test (SBIT), that was developed to be easily administered, portable, cost efficient, reliable and valid.

The SBIT (Helm, 1985) consists of nine female (Appendix A) and nine male (Appendix B) silhouettes that increase in percent body weight from an emaciated body size to an obese body size. The silhouettes were drawn freehand and not from representations of individuals differing in body size. The artist was instructed to draw the male and female silhouettes

so that the fifth silhouette would represent an individual of average weight. Each of the remaining eight silhouettes were to represent the same individual at 5%, 10%, 15%, and 20% overweight and underweight. The silhouettes were then measured along the horizontal axis to determine the actual difference in body size from one silhouette to the next. The largest area across the hips, thighs, calves and chest, and the smallest area across the waist was used to determine the total body area. The percent body weight for each silhouette was then determined (Table 1, Appendix C) based on the assumption that silhouette number five represented an individual of average weight.

The silhouettes were presented to subjects in two ways: in the form of a book, randomly assigned with one per page; and on a continuum side by side in ascending order. There were four sets of randomly assigned silhouettes and one set on a continuum. Subjects were required to identify the silhouette, on each of the five trials, that they believed represented their own and their partner's body size. Results indicated that subjects were consistent in their estimations across the five trials (Table 2, Appendix D). No significant differences between trials were found for either subjects estimations of themselves or their partners.

Results indicated that subjects were accurate in identifying the silhouette which best represented their own or their partner's body size (Table 3, Appendix E). Over 90%

of the subjects chose within \pm one silhouette from the actual body size for both their own estimations and their partner's estimations. Correlations between subjects actual body size and means of their estimates for themselves and their partner's range from $r=.55$, $p<.01$ to $r=.80$, $p<.001$ (Table 4, Appendix F).

The results of the study indicated that the SBIT was a viable method for the measurement of body image perception. Test re-test reliability and construct validity was clearly demonstrated. Although these results were good, it became apparent during the course of the study that there was a definite problem with the SBIT. Because the silhouettes were drawn freehand from an artist's perception of what an individual of average weight, overweight or underweight looked like, there was no way to determine if the silhouettes were accurate representations of an individual differing in percent body weight.

In the present study, the SBIT was re-developed using a video camera distortion technique (Freeman et al., 1984) capable of distorting the image of an individual 20% thinner to 20% fatter. This produced silhouettes of actual body sizes differing in percent body weight with equal intervals between them. The SBIT was then used to assess the body image perception of anorexic, bulimic and control groups.

In addition, this study examined the relationship between body image perception and self-esteem. In a recent

study, Thompson and Thompson (1986) found a significant negative correlation between body image distortion and self-esteem in asymptomatic, normal weight females. Garner and Garfinkel (1981-82) also found a significant negative correlation between overestimation and self-esteem with anorexic subjects. Based on these two findings, it was hypothesized that there would be a negative correlation between self-esteem and overestimation.

Although reports regarding treatment are encouraging, a high relapse rate remains. Neuman and Halvorson (1983) report that 38% of treated anorexics are re-hospitalized within a two year period and 18% remain chronic and unchanged. In a review of the existing literature, Bemis (1978) reports a mortality rate of 3% to 25% as a result of complications from the disorder or from suicide. It is believed that this may be the result of a continuing body image distortion problem that is associated with poor self-esteem. Once this relationship is identified, different treatment approaches can be implemented that focus on improving self-esteem and there by helping to correct the body image distortion problem.

Method

Subjects: Forty female patients diagnosed with anorexia nervosa or bulimia participated in the present study. Patients were receiving treatment at the Eating Disorders Centre, Douglas Hospital, Montreal or the Eating Disorders Centre, Health Science Centre, Winnipeg. Twenty non-eating disordered females volunteered to participate as the control group. Subjects were registered in one of two undergraduate courses at Lakehead University, Thunder Bay. An additional 29 non-eating disordered females volunteered to participate, but were excluded from the study for one or more of the following reasons: elevated scores on the Eating Disorders Inventory; above the age range of the eating disordered sample; body weights fell at the extreme ends of the spectrum (e.g. below 85% or above 115% of ideal body weight); or failed to complete the required material for the study.

Apparatus: Standard consent forms (Appendix G) which outlined the purpose and requirements of the study were used. A Patient Information Form (Appendix H) was developed and used for primary therapists to record information about the eating disordered patients.

The Eating Disorders Inventory (EDI), (Garner, Olmsted & Polivy, 1983), (Appendix I) was used for subject classification. The EDI is a 64-item questionnaire which

assesses respondents feelings and thoughts about weight, body image and food related areas. Garner et al. (1983) have found the EDI to be a reliable and valid test for distinguishing between anorexic, bulimic, and healthy individuals.

The Rosenberg Self-Esteem Scale (RSE), (Rosenberg, 1979), (Appendix J), was used as the measure of self-esteem. The RSE is a 10-item Guttman scale of self-esteem where subjects are asked to strongly agree, agree, disagree, or strongly disagree to the 10 statements. Silber and Tippett (1965) found a test re-test reliability of $r=0.85$, $p<.001$, for a two week period, and a correlation of $r=0.56$, $p<.01$, between RSE scores and psychiatrists ratings of self-esteem.

The revised Silhouette Body Image Test (SBIT), (Appendix K) was used to measure body image perception. The silhouette images were developed using a modified video camera (Freeman et al., 1984). The image of a female, considered to be of ideal body weight for age, height and body frame (Metropolitan Life Insurance Company, 1983) was distorted 5%, 10%, 15%, and 20% thinner and fatter. These images were recorded on a 3 1/4 in. video recorder. The actual and distorted images were then drawn directly from the video screen. The newly drawn images were then measured against the images on the video screen to ensure the accuracy of the silhouettes. The silhouettes were then transferred onto 8x10 in. photographic paper and mounted. The

silhouettes were numbered from 1 to 9 in ascending order.

A difference score between the silhouette number which represents subjects actual body size and their perceived silhouette number is the measure for body image perception. Possible SBIT scores range from -8 to +8, with a negative score for underestimation of body size, a positive score for overestimation and a 0 for accurate perception.

Procedure: At the time of recruitment, subjects were provided with a package of material which included the appropriate consent form, the EDI and the RSE. Subjects under the age of 18 years were required to have consent from their parents. Eating disordered patients were also required to have consent from their primary therapist. The patient information form was given directly to the primary therapists to complete and return to the experimenter. Subjects were required to complete the forms and questionnaires prior to the testing session.

Eating disordered subjects were categorized into groups according to the DSM-III (1980) criteria and primary therapist recommendations obtained from the completed patient information forms. The anorexic subjects were categorized into the restrictor group and bulimic group based on the presence or absence of bulimic behaviors, while maintaining a diagnosis of anorexia nervosa. Subjects were assigned to one of the following four groups: Anorexic Restrictor (AN-R);

Anorexic with Bulimic Behaviors (AN-B); Bulimia with a prior history of Anorexia Nervosa (B-AN); and Bulimia with no prior history of Anorexia Nervosa (B-NA). Table 5 outlines the characteristics of the eating disordered population.

The non-eating disordered females were categorized into either an Athletic Control group (AC) or a Non-athletic Control group (NC). Non-eating disordered subjects in the athletic control group met the criteria of participating in a sport (running, tennis, weight lifting, aerobics, swimming, classical/jazz ballet, ect.) for a period of 1.5 to 2 hours at a time, four or more days per week. The athletic control group was included in the study to determine if increased attention to the body influenced perceived body size. Table 5 outlines the characteristics of the control subject groups.

Participants were tested individually at private testing sessions. Each subject's height, weight and bone structure size was measured and recorded at the beginning of the testing session. Bone structure was measured with standard bone calipers. Participants were then presented with the nine silhouettes in ascending order. Subjects were instructed (Appendix L) to look carefully at each silhouette and identify the one which they believed represented their actual body size.

After the testing session, the subject's percent of ideal body weight was calculated and the silhouette representing their actual body size was recorded. Subjects

Table 5

Characteristics of the Clinical and Control Samples

	N	Age		% IBW		AOED		DI (MTH)	
		Range	\bar{X}	Range	\bar{X}	Range	\bar{X}	Range	\bar{X}
AN-R	11	14-35	22.1	62- 94	78.4	12-25	18	8-144	51
AN-B	11	13-38	23.9	72- 95	83.3	11-32	19.6	18-108	53
B-AN		21-26	23.6	82-103	90.4	16-18	16.2	36-120	89
B-NA		19-38	26.0	80-100	93.4	13-27	18	12-300	96
AC		19-27	22.1	98-112	103				
NC	10	19-38	24.8	95-103	99.2				

Note. % IBW: Percent Ideal Body Weight

AOED: Age at Onset of Eating Disorder

DI (MTH): Duration of Illness in Months

AN-R: Anorexic Restrictor

AN-B: Anorexic with Bulimic Behaviors

B-AN: Bulimia with prior history of Anorexia Nervosa

B-NA: Bulimia with no history of Anorexia Nervosa

AC: Athletic Control

NC: Non-athletic Control

percent of ideal body weight was calculated using the Metropolitan Life Insurance Tables (1983). The Metropolitan Life Insurance Tables are the most frequently used actuarial data. A difference score between their actual body size silhouette number and their perceived silhouette number was recorded as the SBIT score.

Results

A one-way analysis of variance (ANOVA) was performed on control subject's scores from the Silhouette Body Image Test (SBIT). No significant difference was found between the two control groups (Appendix M). Data from the eating disordered subject's scores on the SBIT was also subjected to a one-way ANOVA with no significant difference between the four groups (Appendix N).

SBIT score data from the two control groups was combined to form one non-eating disordered control group (NC). This was also done to the SBIT score data from the four eating disordered groups (ED). A one-way ANOVA was performed between the NC and ED groups. A highly significant difference was found ($F=37.03$, $p<.0001$), (Appendix O). The mean difference score for the NC group was $-.31$, whereas the mean for the ED group was $+2.1$. With these scores changed into percent overestimation or underestimation, on the average, the NC group underestimated their body size by approximately 2%. The ED group overestimated their body size by over 10%.

A one-way ANOVA was performed on the eating disordered subject's Rosenberg Self-Esteem (RSE) scores. No significant difference was found between the four groups (Appendix P). Data from the control subject's scores on the RSE was also subjected to a one-way ANOVA with no significant difference between the two groups (Appendix Q).

RSE score data from the four eating disordered groups was combined to form one eating disordered group (ED). This was also done to the RSE score data from the two control groups (NC). A one-way ANOVA was performed between the ED and NC groups. A highly significant difference was found ($F=36.46$, $p<.0001$), (Appendix R).

A Pearson Product Moment Correlation (Pearson R) was performed between the RSE scores and SBIT scores for all subjects. A significant negative correlation was found ($r=-.63$, $p<.0001$), (Appendix S).

Discussion

The results indicate that the eating disordered females significantly overestimated their body size when compared with the non-eating disordered females. The non-eating disordered group's difference scores ($X=2\%$) are consistent with the previous study by Helm (1985). Using the SBIT as the measurement technique, non-eating disordered subjects scored within a range of \pm one silhouette from their actual body size. These results and the results from the current study suggest that the average individual, without an eating disorder, would be expected to score within \pm one silhouette of actual body size, or, with not more than a 5% deviation from their actual body size in over- or underestimation.

It is difficult to determine whether the eating disordered group's difference scores are consistent with the literature due to the disagreement as to whether eating disordered females overestimate their body size more than that found in the general population. Clearly in the current study, overestimation has been shown. No difference was found between the four categories of eating disorders. This may be the result of a lack of homogeneity with respect to age, duration of illness, different treatment experiences and length of treatment. On the other hand, it may be that regardless of the differences between patients, overestimation of body size is an intrinsic feature in each of the four categories. Further research with homogeneous

groups is necessary to determine the effect of these differences with respect to body image perception.

A potential difficulty that should be kept in mind are the regional differences between the subject populations. Both clinical samples were located in large metropolitan cities whereas, the control group was located in a much smaller community. Although the geographical regions served by both the treatment programs and the university are extensive and diverse, the possibility of another variable coming into play should be kept in mind when interpreting the results.

As was expected, level of self-esteem was significantly different between the non-eating disordered and eating disordered groups, with the eating disordered group scoring lower. This stands to reason, since individuals experiencing personal difficulties tend to have lower opinions of themselves. Bruch (1973) describes the eating disordered individual with characteristics of feelings of ineffectiveness, emotional reservation, lack of independence and extreme compliance. Poor self-esteem is a natural extension to these other characteristics.

A highly significant negative correlation was found between poor self-esteem and body image distortion. These results suggest that there may be a connection between body image and self-esteem. This is consistent with the work of Thompson and Thompson (1986) who found the same relationship

($\underline{r}=-.40$, $\underline{p}<.05$) with an asymptomatic, normal weight sample. Garner and Garfinkel (1981-82) also found a significant negative correlation ($\underline{r}=-.53$, $\underline{p}<.003$) between body image distortion and self-esteem in anorexic females. Garner and Garfinkel (1981-82) suggest that an individual's expectations and perceptions are determined by their self-evaluation of general, non-physical attributes. As such, if an anorexic "views the non-physical aspects of herself negatively and if she also equates low self-worth with "fatness", she may "see" herself as larger than her actual size" (1981-82, p.278). Garner and Garfinkel (1981-82) suggest that low self-esteem may play a major role in body image perception in eating disordered individuals. It may be possible to correct body image distortion by increasing self-esteem. It should be noted however, that although a correlational relationship has been shown, a causal relationship has not. As such, there is no way to determine whether poor self-esteem caused the body image distortion, vice versa, or if they happen to be just two separate characteristics. Further research to investigate the causal nature of this relationship is needed in this area.

As was previously pointed out, it has been suggested that the available techniques for assessing body image distortion do not provide reliable and valid measures. Those instruments shown to be reliable and valid are expensive, cumbersome, time consuming and restricted in their

availability. The SBIT was shown to be a reliable and valid measure of body image perception (Helm, 1985). The results of the current study, for the non-eating disordered group, were consistent with the results of the previous study. The SBIT is also inexpensive, portable and is administered easily and quickly. One unavoidable problem with the SBIT is that of a ceiling effect. Due to the fact that most anorexics actual body size is generally located at the bottom end of the scale, they have a larger range of choices for overestimating their body size.

Clinically, it is very difficult to correct a body image distortion problem in eating disordered females. Bruch (1973) suggests that "patients may gain weight for a variety of reasons but no real or lasting cure is achieved without correction of the body image misperceptions" (p.90). The SBIT may be of benefit in a number of clinical areas. First, as an assessment measure, not only does the SBIT identify distorted body image, it also provides a level of the magnitude of the problem. The SBIT may be used to continually re-assess the patients progress with on going treatment and at follow-up appointments. Finally, the SBIT can be used as a teaching tool to demonstrate to the patient objectively, differences between her perceived and actual body size.

It may be interesting to develop a new SBIT using an anorexic as the model for the silhouette drawings. Instead

of distorting an image of an average individual both thinner and fatter, the image of an anorexic could be distorted in a positive direction to produce the silhouettes differing in body size. The distortions from an anorexic model may appear different and as such, may approximate closer the eating disordered individuals perceptions of body size.

For research purposes, the SBIT can be a valuable tool. Little is known about the premorbid anorexic, except from retrospective information. Although body image distortion appears to be a major characteristic in eating disorders, many questions go unanswered. When did the distorted body image first start occurring? Was the problem present prior to or after the development of the full blown syndrome? Does the distorted body image help maintain the illness? Can a patient be taught to correct for or compensate for her distorted body image? Longitudinal studies are needed to investigate these and other questions. Because the SBIT is inexpensive and portable, it would be ideal for screening large groups of adolescents in high schools. Future research in the area of body image distortion will also benefit from a technique which is quickly and easily administered.

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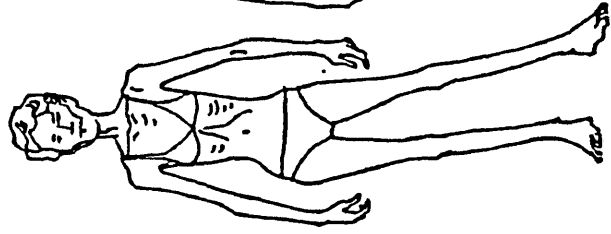
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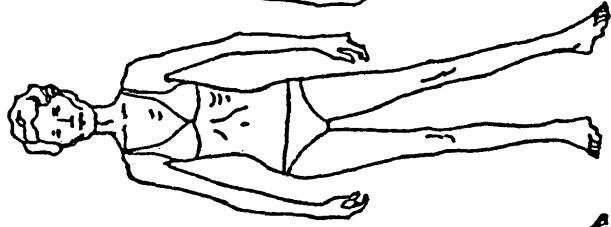
Appendix A

Original Female Silhouettes

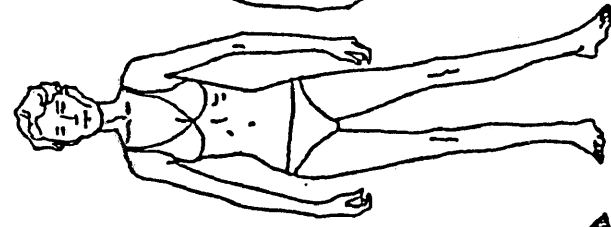
Silhouettes shown one-third (1/3) their actual size.



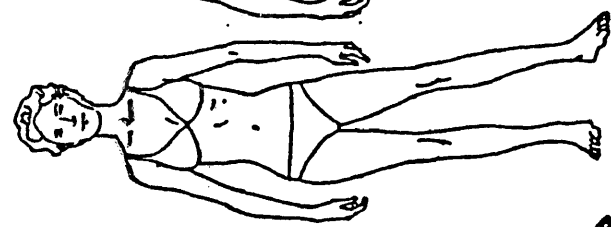
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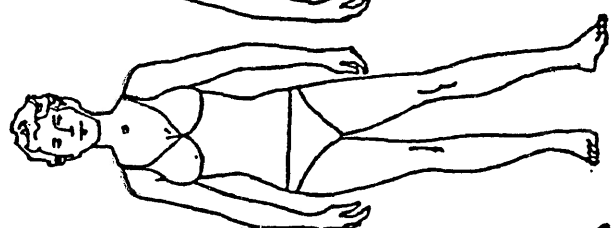
2



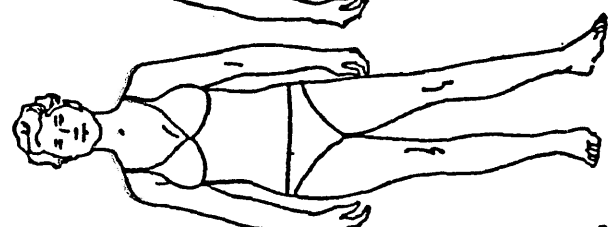
3



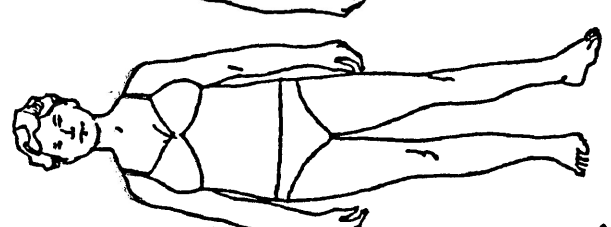
4



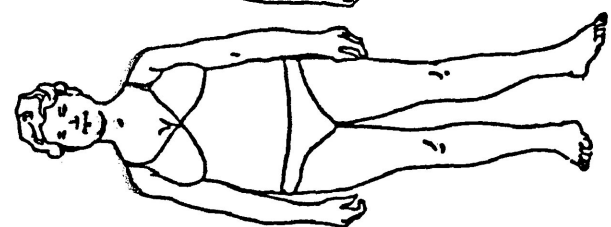
5



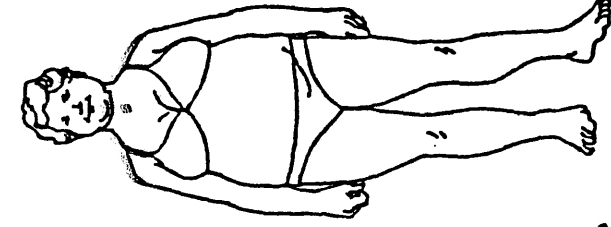
6



7



8

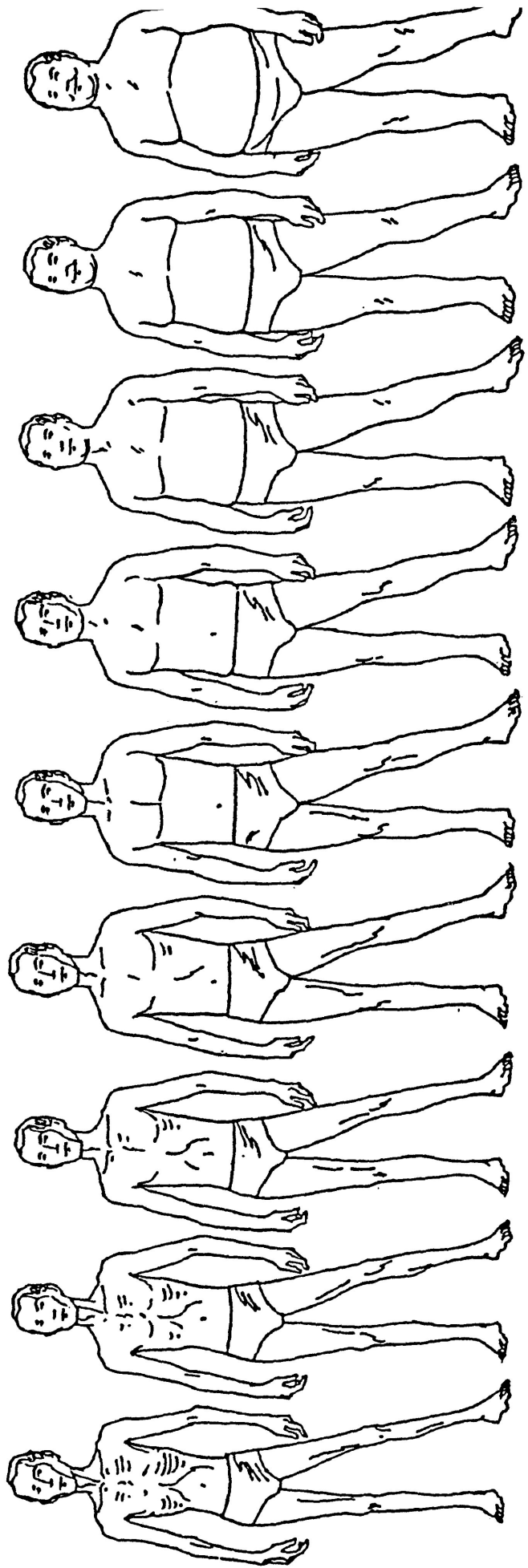


9

Appendix B

Original Male Silhouettes

Silhouettes shown one-third (1/3) their actual size.



1 2 3 4 5 6 7 8 9

Appendix C

Table 1

Percent body weight as determined by area of each silhouette

Table 1

Percent Body Weight As Determined By Area of Each Silhouette

Subject	Silhouette Number								
	1	2	3	4	5	6	7	8	9
Females	71%	79%	84%	90%	100%	110%	118%	131%	148%
Males	70%	79%	85%	92%	100%	107%	118%	128%	137%

Note. The values obtained above are based on the assumption that silhouette number five (5) is of average weight for height and build.

Appendix D

Table 2

Consistency of subjects estimations across trials

Table 2

Consistency Of Subjects Estimations Across Trials

	Estimations For:	
	Self	Partner
Choice of One Silhouette	66% (56)	64% (53)
Choice of Two Adjacent Silhouettes	32% (26)	35% (30)
Choice of Three Adjacent Silhouettes	2% (2)	1% (1)

Note. Numbers in brackets refer to the actual number of subjects.

Appendix E

Table 3

Accuracy of subjects estimations to actual body size

Table 3

Accuracy Of Subjects Estimations to Actual Body Size

	Estimations For:	
	Self	Partner
100% Correct	40%	35%
	(33)	(29)
Within \pm One	59%	56%
Silhouette	(50)	(47)
More Than \pm One	1%	9%
Silhouette	(1)	(8)

Note. Numbers in brackets refer to the actual number of subjects

Appendix F

Table 4

Correlations obtained between subjects actual body size
and means of their estimations

Table 4

Correlations Obtained Between Subjects Actual Size And Means
Of Their Estimations

Estimations	For	r Value
All Subjects	Self	.75*
	Partner	.65*
Female Subjects	Self	.74*
	Partner	.67*
Male Subjects	Self	.80*
	Partner	.62*
Female Subjects	Same Sex Partner	.67*
	Opposite Sex Partner	.71*
Male Subjects	Same Sex Partner	.73*
	Opposite Sex Partner	.55**

Note. * Denotes significance at $p < .001$

** Denotes significance at $p < .01$

Appendix G

Consent Forms

- A. Consent form for Health Science Centre, Winnipeg
- B. Consent form for Douglas Hospital, Montreal
- C. Consent form for Lakehead University, Thunder Bay

CONSENT FORM

Body Image Perception and Self-Esteem

This study is designed to examine how you view your body and how this relates to how you feel about yourself. The study involves one experimental session, which will last no longer than 1 1/2 hours and which will be held at your convenience. At this time you will be asked to complete two questionnaires that examine your attitudes and feelings about various things in your life. You will also be asked to look at a series of pictures and choose the one that best represents your body size. Your performance will be kept strictly confidential and results will be reported on a group basis only. At no time during this experiment will you be asked to do anything that contains any risks or discomfort. You are not obligated in any way to participate in this study. You may withdraw from the study at any time and you may refuse to answer any questions you are asked without any penalty. Any current treatment that you are now receiving at Health Sciences Centre, and any further treatment you may require, will not be affected in any way if you decide not to answer some questions or to participate at all, or if you decide to withdraw from the study.

The results of this study, and your own individual results, will be made available to you on request. If you would like to participate in this study please complete and sign the informed consent below.

I have read and understand the above statements and the procedures to be used in this study and I agree to participate in this study. I understand that I may withdraw from this study at any time without any consequences.

Print Name _____ Phone Number _____

Date of Birth _____ Height _____ Weight _____

Date _____ Participant's Signature _____

Parent's Signature if Under 18 _____

Signature of Witness _____

If you are receiving medical care at the moment:

Physician's Name _____ Phone Number _____

Physician's Signature _____

Appendix H

Patient Information Form

Patient Information Form

To be completed by your primary therapist or physician.

Patient's Name _____

Physician's Name _____ Phone Number _____

Based on your clinical judgement and the Diagnostic and Statistical Manual III, please choose one of the following diagnosis:

_____ Anorectic Restricter

_____ Anorectic with Bulimic Behaviors

_____ Bulimic with a Prior History of Anorexia Nervosa

_____ Bulimia with no Prior History of Anorexia Nervosa

Bulimic behavior of: _____ Vomiting _____ Diuretics _____ Laxatives

Length of Illness _____ Age at Onset _____

Treatment Experiences:

A. Hospitalizations

B. Outpatient Treatment

C. Group Therapy

D. Medication History

Physician's Signature _____

Appendix I

Eating Disorders Inventory

E.D.I.

Name: _____ Date: _____

Age: _____

Present Weight: _____ Height: _____ Sex: _____

Highest Past Weight: _____ (lbs.)

(excluding pregnancy)

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 To Be? _____ (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 SO 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.

Note: Asterisks (*) represent negatively scored items.

			S		
			O		
			M		
A	U		E	R	
L	S		T	A	N
W	A	O	F	I	R
A	L	F	T	M	E
Y	L	T	E	M	V
S	Y	E	N	E	L
		N	S	L	E
				Y	R

- () () () () () () * 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.

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- () () () () () () 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.
- ') () () *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.

A L W A Y S
 U S U A L L Y
 O F T E N
 S O M E T I M E S
 R A R E L Y
 N E V E R

- ' () () () () 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 (overeating).
- ' () () () () *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.
- () () () () () () 45. I think 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 small 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.

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- () () () *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 (emotionally).
- ') () () () () () *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 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.

Appendix J

Rosenberg Self-Esteem Scale

R.S.E.

This is a scale which measures some feelings that you may have about yourself. THERE ARE NO RIGHT OR WRONG ANSWERS SO TRY VERY HARD TO BE COMPLETELY HONEST IN YOUR ANSWERS. RESULTS WILL BE KEPT COMPLETELY CONFIDENTIAL. Read each question very carefully and circle the answer which applies best for you. Thank you.

SA = STRONGLY AGREE

A = AGREE

D = DISAGREE

SD = STRONGLY DISAGREE

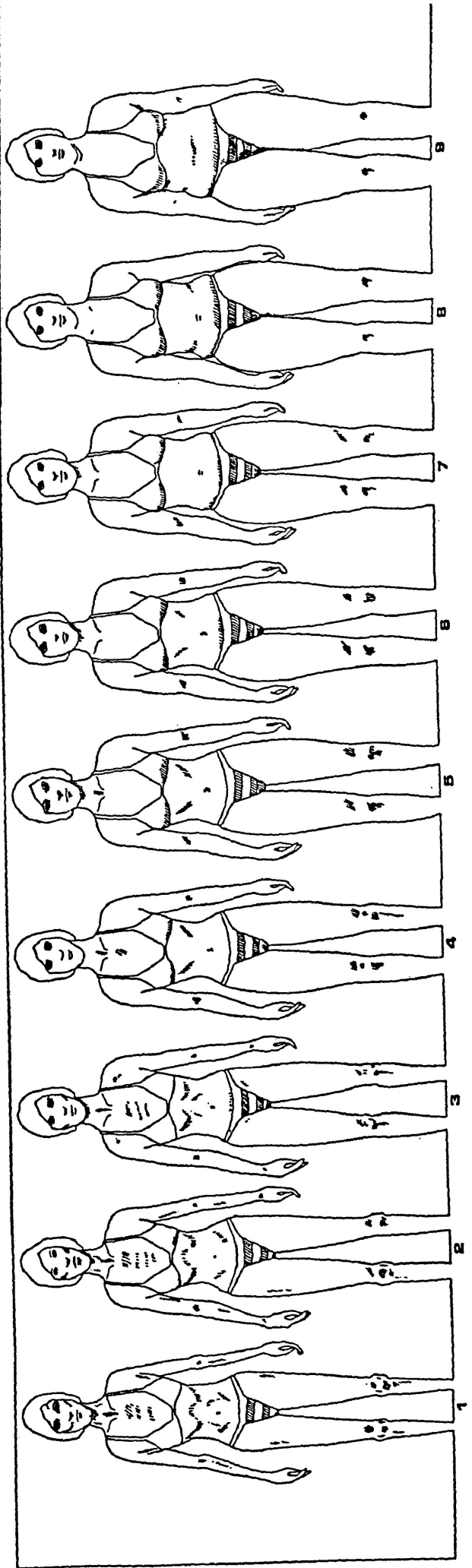
- | | | | | |
|-----|----|----|-----|---|
| SA | .. | D* | SD* | 1. On the whole, I am satisfied with myself. |
| SA* | A* | D | SD | 2. At times I think I am no good at all. |
| SA | ^ | D* | SD* | 3. I feel that I have a number of good qualities. |
| SA | | D* | SD* | 4. I am able to do things as well as most other people. |
| SA* | A* | D | SD | 5. I feel I do not have much to be proud of. |
| SA* | A* | D | SD | 6. I certainly feel useless at times. |
| SA | ^ | D* | SD* | 7. I feel that I'm a person of worth, at least on an equal plane with others. |
| SA* | A* | " | SD | 8. I wish that I could have more respect for myself. |
| SA* | A* | " | SD | 9. All in all, I am inclined to feel that I am a failure. |
| SA | | D* | SD* | 10. I take a positive attitude toward myself. |

Note: Asterisks (*) represent low self-esteem responses.

Appendix K

Revised Silhouette Body Image Test

Silhouettes shown one-third their actual size.



Appendix L

Verbatim Instructions to Subjects

Verbatim Instructions to Subjects

Please look carefully at each of the nine silhouettes presented here. I would like you to imagine that the same person is represented in each silhouette, and that just her body size has changed. I would also like you to imagine that this person is the same height and bone structure as you are. Look at the silhouettes carefully and choose the one that you believe is the best representation of your own body size. You must choose just one silhouette.

Appendix M

ANOVA Table of Difference Between the Control Groups on the
SBIT

Table M

Difference Between the Control Groups on the SBIT

Factor Level Information					
Factor	Levels	Values			
Group	2	CA	CN		
Number of Cells = 2		Data Values = 19	Missing Values = 0		
Cell Information					
Factor Levels		Cell N	Mean	Total	
CA = Athletic Controls		10	-.20	-2.0	
NC = Non-athletic Controls		9	-.44	-4.0	
N = 19	Mean = -.32	USS = 10.00	CSS = 8.11		
Response Variable is SBIT Score					
Source of Variation	d.f.	Sum of Squares	Mean Square	F-Ratio	P <
Between Groups	1	.28	.28	.62	NS
Within Groups	17	7.82	.46		
Corrected Total	18	8.11			

Appendix N

ANOVA Table of Difference Between the Eating Disordered Groups
on the SBIT

Table N

Difference Between the Eating Disordered Groups on the SBIT

Factor Level Information					
Factor	Levels		Values		
Group	4	AN-R	AN-B	B-AN	B-NA
Number of Cells = 4 Data Values = 40 Missing Values = 0					
Cell Information					
Factor Levels		Cell N	Mean	Total	
AN-R = Anorexia Nervosa Restrictor		11	1.55	17.0	
AN-B = Anorexia Nervosa with Bulimia		11	2.55	28.0	
B-AN = Bulimia, History of Anorexia		5	2.60	13.0	
B-NA = Bulimia, No History of Anorexia		13	2.00	26.0	
N = 40		Mean = 2.10	USS = 284.00	CSS = 107.60	
Response Variable is Difference Scores from the SBIT					
Source of Variation	d.f.	Sum of Squares	Mean Square	F-Ratio	P <
Between Groups	3	6.95	2.32	.83	NS
Within Groups	36	100.65	2.80		
Corrected Total	39	107.60			

Appendix 0

ANOVA Table of Difference Between Control and Eating
Disordered Groups on the SBIT

Table 0

Difference Between Control and Eating Disordered Groups on
the SBIT

Factor Level Information					
Factor	Levels		Values		
Group	2		ED		NC
Number of Cells = 2			Data Values = 59	Missing Values = 0	
Cell Information					
Factor Levels		Cell N	Mean	Total	
NC = Normal Control Subjects		19	-.32	-6.0	
ED = Eating Disordered Subjects		40	2.10	84.0	
N = 59	Mean = 1.32	USS = 294.0	CSS = 190.88		
Response Variable is SBIT Score					
Source of Variation	d.f.	Sum of Squares	Mean Square	F-Ratio	P <
Between Groups	1	75.18	75.18	37.03	.0000
Within Groups	57	115.71	2.03		
Corrected Total	58	190.88			

Appendix P

ANOVA Table of Difference Between the Eating Disordered Groups
on the RSE

Table P

Difference Between the Eating Disordered Groups on the RSE

Factor Level Information					
Factor	Levels		Values		
Group	4	AN-R	AN-B	B-AN	B-NA
Number of Cells = 4 Data Values = 40 Missing Values = 0					
Cell Information					
Factor Levels		Cell N	Mean	Total	
AN-R = Anorexia Nervosa Restrictor		11	23.73	261.0	
AN-B = Anorexia Nervosa with Bulimia		11	21.91	241.0	
B-AN = Bulimia, History of Anorexia		5	22.20	111.0	
B-NA = Bulimia, No History of Anorexia		13	23.31	303.0	
N = 40		Mean = 22.90	USS = 22316.0	CSS = 1339.60	
Response Variable is RSE Score					
Source of Variation	d.f.	Sum of Squares	Mean Square	F-Ratio	P <
Between Groups	3	22.94	7.65	.21	NS
Within Groups	36	1316.66	36.57		
Corrected Total	39	1339.60			

Appendix Q

ANOVA Table of Difference Between the Control Groups on the
RSE

Table Q

Difference Between the Control Groups on the RSE

Factor Level Information					
Factor	Levels	Values			
Group	2	CA	CN		
Number of Cells = 2		Data Values = 19	Missing Values = 0		
Cell Information					
Factor Levels		Cell N	Mean	Total	
CA = Athletic Controls		10	30.80	308.0	
NC = Non-athletic Controls		9	33.11	298.0	
N = 19	Mean = 31.89	USS = 19618.00	CSS = 289.79		
Response Variable is RSE Score					
Source of Variation	d.f.	Sum of Squares	Mean Square	F-Ratio	P <
Between Groups	1	25.30	25.30	1.63	NS
Within Groups	17	264.48	15.55		
Corrected Total	18	289.79			

Appendix R

ANOVA Table of Difference Between Control and Eating
Disordered Groups on the RSE

Table R

Difference Between Control and Eating Disordered Groups on the RSE

Factor Level Information					
Factor	Levels		Values		
Group	2		ED	NC	
Number of Cells = 2		Data Values = 59	Missing Values = 0		
Cell Information					
Factor Levels		Cell N	Mean	Total	
NC = Normal Control Subjects		19	31.89	606.0	
ED = Eating Disordered Subjects		40	22.90	916.0	
N = 59	Mean = 25.80	USS = 41934.0	CSS = 2671.56		
Response Variable is RSE Score					
Source of Variation	d.f.	Sum of Squares	Mean Square	F-Ratio	P <
Between Groups	1	1042.17	1042.17	36.46	.0000
Within Groups	57	1629.39	28.59		
Corrected Total	58	2671.56			

Appendix S

Correlation Table Between Self-Esteem and Body Image
Perception for all Subjects

Table S

Relationship Between Self Esteem and Body Image Perception
For All Subjects

Correlations and Probabilities

	Difference Score	RSE Score
Difference Score	1.0	-.634547
P <	.000000	.000000
RSE Score	-.634547	1.0
P <	.000000	.000000

High Correlations Retained

P (|r| > .090) = .5000 for n = 59

	Difference Score	RSE Score
Difference Score	*	-.634547
RSE Score	-.634547	*

Correlations and Squared Multiple Correlations

	Difference Score	RSE Score
Difference Score	.402650	-.634547
RSE Score	-.634547	.402650

Note. Diagonal Entries: R-Squared between each variable
and the other variables.

CONSENT FORM

Body Image Perception and Self-Esteem

This study is designed to examine how you view your body and how this relates to how you feel about yourself. The study involves one experimental session, which will last no longer than 1 1/2 hours and which will be held at your convenience. At this time you will be asked to complete two questionnaires that examine your attitudes and feelings about various things in your life. You will also be asked to look at a series of pictures and choose the one that best represents your body size. Your performance will be kept strictly confidential and results will be reported on a group basis only. At no time during this experiment will you be asked to do anything that contains any risks or discomfort. You are not obligated in any way to participate in this study. You may withdraw from the study at any time and you may refuse to answer any questions you are asked without any penalty. Any current treatment that you are now receiving at The Douglas Hospital, and any further treatment you may require, will not be affected in any way if you decide not to answer some questions or to participate at all, or if you decide to withdraw from the study.

The results of this study, and your own individual results, will be made available to you on request. If you would like to participate in this study please complete and sign the informed consent below.

I have read and understand the above statements and the procedures to be used in this study and I agree to participate in this study. I understand that I may withdraw from this study at any time without any consequences.

Print Name _____ Phone Number _____

Date of Birth _____ Height _____ Weight _____

Date _____ Participant's Signature _____

Parent's Signature if Under 18 _____

Signature of Witness _____

If you are receiving medical care at the moment:

Physician's Name _____ Phone Number _____

Physician's Signature _____

CONSENT FORM

Body Image Perception and Self-Esteem

This study is designed to examine how you view your body and how this relates to how you feel about yourself. The study involves one experimental session, which will last no longer than 1 1/2 hours and which will be held at your convenience. At this time you will be asked to complete two questionnaires that examine your attitudes and feelings about various things in your life. You will also be asked to look at a series of pictures and choose the one that best represents your body size. Your performance will be kept strictly confidential and results will be reported on a group basis only. At no time during this experiment will you be asked to do anything that contains any risks or discomfort. You are not obligated in any way to participate in this study. You may withdraw from the study at any time and you may refuse to answer any questions you are asked without any penalty. Your evaluation in this or any other course at Lakehead University will not be affected in any way if you decide not to answer some questions, or to participate at all, or if you decide to withdraw from the study.

The results of this study, and your own individual results, will be made available to you on request. If you would like to participate in this study please complete and sign the informed consent below.

I have read and understand the above statements and the procedures to be used in this study and I agree to participate in this study. I understand that I may withdraw from this study at any time without any consequences.

Print Name _____ Phone Number _____

Date of Birth _____ Height _____ Weight _____

Date _____ Participant's Signature _____

Parent's Signature if Under 18 _____

Signature of Witness _____

If you are receiving medical care at the moment:

Physician's Name _____ Phone Number _____

Physician's Signature _____