

BODY IMAGE DISTURBANCE IN ANOREXIA NERVOSA

by

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1. Introduction

Anorexia nervosa is an eating disorder characterized by the relentless pursuit of a thin body size. It affects mainly adolescent girls and young women, but is also observed in older women and males¹ (Bruch, 1962).

Anorexia nervosa is a major medical concern. The severe self-starvation affecting cardiovascular, renal and hematological measurements, and electrolyte levels may result in death (Maloney and Klykylo, 1983). Since the prevalence of this disorder appears to be increasing (Hill, 1977; Schwartz et al., 1982), anorexia nervosa has been gaining the attention of clinicians and researchers in the past few years.

However, there has been considerable controversy over the years about the clinical features needed for conclusive diagnosis. Feighner and his co-workers had attempted in 1972 to develop objective diagnostic criteria for use in clinical research (see Appendix A). The main criteria are (1) onset of anorexia nervosa before 25 years of age, (2) anorexia with accompanying weight loss of at least 25% of original body weight, and (3) a distorted body image and a distorted attitude toward eating and food (Halmi, 1983). These criteria exclude women with a later onset who satisfy all other criteria. Also, a patient whose illness is in the developing stage would not be included. Because of these factors some investigators do not believe the Feighner diagnostic criteria are appropriate and clinically applicable. They prefer the less restrictive, modified Feighner-criteria (Fries, 1977; Garfinkel et al., 1980; Buvat-Herbaut, 1983). In addition, vomiting and bulimic subgroups of anorexia nervosa, which indicate the heterogeneity of this disorder, have only recently been

¹Since anorexia nervosa is predominantly a female condition, the patient is referred to as "she" throughout this review.

emphasized (Garfinkel et al., 1980; Casper et al., 1980). On the other hand, the American Psychiatric Association distinguishes between anorexia nervosa and bulimia (DSM III, 1980, see Appendix B). In contrast to the anorexics' severe weight loss, the weight fluctuations in bulimia are never so extreme as to be life-threatening.

However, in diagnosing and treating anorexia nervosa, most investigators still refer to Bruch's model. This involves interoceptive disturbances, an overall sense of ineffectiveness and disturbances of the body image (Bruch, 1962). The evaluation of the disturbance of body image appears to be a tool for the diagnosis of anorexia nervosa. Subsequently, body image disturbance might be used, as well, as an evaluation parameter of a successful treatment: the disturbance will disappear.

In addition, a realistic body image seems to be a precondition for recovery in anorexia nervosa (Bruch, 1962). Therefore, body image disturbance has received specific attention by therapists. Brinkmann et al. (1981) applied "body therapy"--developed by Alexander Lowen and Wilhelm Reich--to the treatment of body image disturbances in anorexics in order to increase their body awareness.

This report will focus on the importance of body image disturbances in anorexics as a diagnostic tool and as an evaluation parameter of a treatment only.

2. The concept of body image

The concept of body image evolved from observations of patients with schizophrenia and of patients who had phantom sensations associated with loss of body parts. This provides support for the fact that one's body image is not necessarily consistent with one's anatomical appearance (Garner and Garfinkel, 1977). Body image has been described as the picture of one's own body which one forms in the mind (Schilder, 1935; Traub and Orbach, 1964). Schilder theorized that the body image distortions are associated with areas which are the focus of attention. Moreover, it includes the attitudes and feelings of the individual to his/her body (Fisher, 1958).

Although the term 'body image' has been broadly applied, its specific meaning is not clear. Shontz (1974), in particular, has been critical of the broadly applied term 'body image'; it "has become a thing rather than an abstraction" (p. 461). The use of the label 'body image disorder' may cause superficial consensus and satisfaction, but also may block further inquiry into the nature of a given malfunction.

However, the body image concept is clinically important in recognizing anorexia nervosa (Bruch, 1962). A disturbed body image is inferred from the anorexic patient's attitudes about her body. Therefore, Bruch (1962) claimed that a corrective change of the body image is important for recovery in anorexia nervosa.

Other investigators found body image disturbances to be a widespread phenomena, by no means confined to anorexics alone. In 1977, Slade reported about body image disturbances in pregnant women (Ben-Tovim et al., 1979). Also, obese subjects tend to overestimate their body sizes (Garner et al., 1976).

A wide range of investigatory techniques have been developed to assess body image disturbances in these populations. Self-drawings, various questionnaires, interviews and measures involving the visual and tactile perception of one's self have been used. With the terminology limitations in mind, the following review of empirical studies and clinical experiences will describe the body image disturbances of anorexics.

3. Methods of objective measurement of body image

Attempts to objectively measure clinical impressions of body image disturbances in anorexics have focused on both tactile and visual perception. Such methods for visual perception as the movable caliper technique, the distorting photograph technique and the TV-monitor-method have been applied to the assessment of body image. Tactile perception has been studied by means of the image-marking method.

3.1. Movable Caliper Technique (MCT)

Body size measures are obtained by use of a 'visual size estimation apparatus.' The apparatus consists of a movable horizontal bar, mounted on a vertical stand. Two lights are mounted on the horizontal bar which can be moved outward and inward from the central point. The distance between the lights can be measured by an instrument attached at the horizontal bar. The experimenter moves the lights gradually outwards or inwards. The subject wearing normal clothes is asked to say when the distance between the lights correspond to the distance across her body part. Perceived size measures are obtained by this method. The real size measures are determined using an anthropometer. For comparison purposes the body perception index is calculated by use of the formula:

$$\text{Body perception index} = \frac{\text{Perceived Size}}{\text{Real Size}} \times 100$$

A value of 100 corresponds to accurate perception. A value less than 100 shows underestimation, whereas a value greater than 100 indicates overestimation (Slade and Russell, 1973a). This technique was originally developed by Reitmann and Cleveland (1964). They assessed the body image in schizophrenic and controls. However, other investigators also used

'total body perception index' which is defined as the mean of the body indices of all body regions investigated (Fries, 1977; Pierloot and Houben, 1978).

3.2. Distorting Photograph Technique (DPT)

This technique was originally described by Glucksmann and Hirsch (1969). Garner et al. applied it first in 1976 to the study of body size perception in anorectic patients: at the beginning of the session, a standardized slide photograph of the subject in full length and in a two-piece bathing suit is made. This slide is projected on a screen in front of the seated subject. Prior to projection on the screen, the slide is distorted by 20% in a direction of appearing thin or fat by a variable anamorphic lens. The subject is asked to make the distorted screen image correspond to her body, as it is perceived at that moment by herself. The perceived size is compared with the real size, yielding the body perception index (see fig. 1, p. 7).

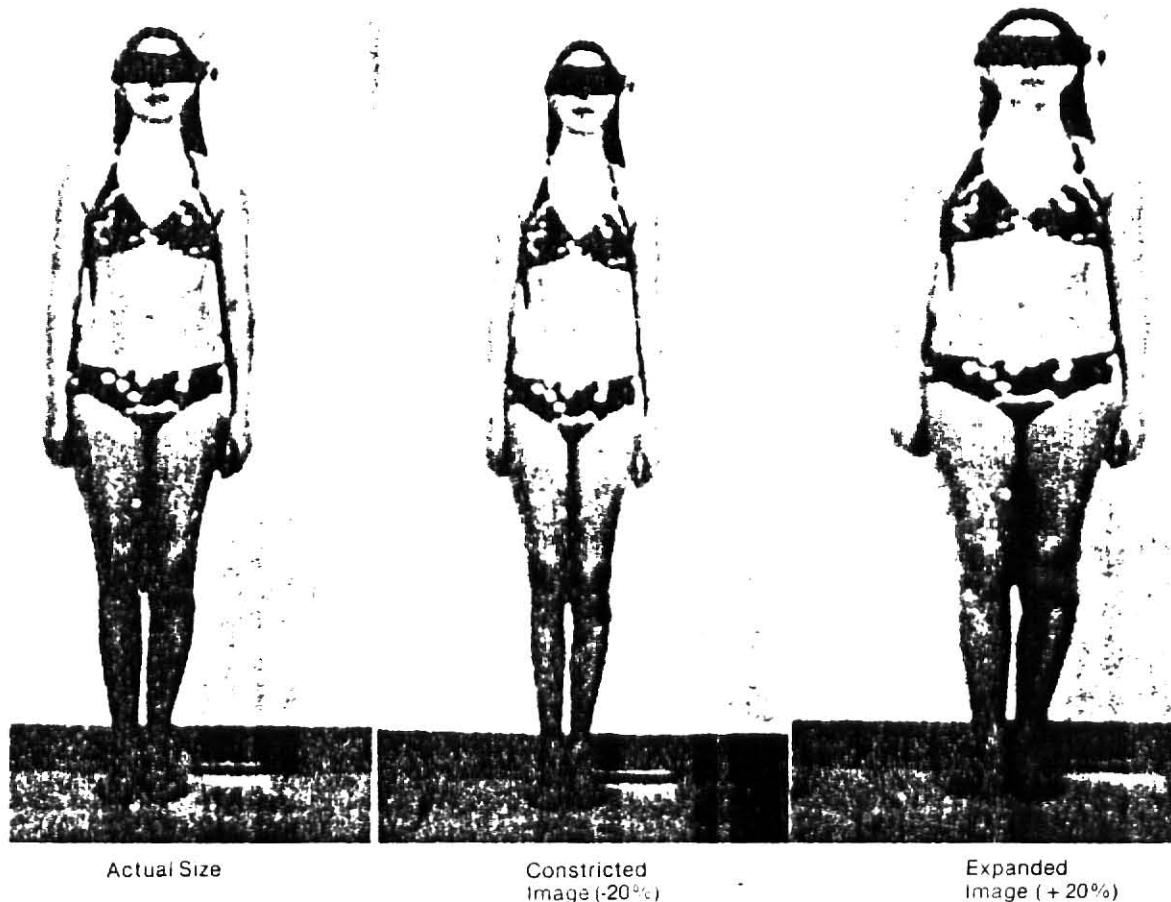


Fig. 1. Range of images projected through the anamorphic lens (Garner and Garfinkel, 1980, p. 135).

3.3. Image-Marking-Method (IMM)

Askevold (1975) has developed a method where the patient makes a self-recording of specific body parts: the subject stands before a sheet of paper--1.5 by 1.0 m--taped to the wall. She is asked to imagine herself standing before a mirror and looking at herself. The investigator stands behind the subject firmly touching with his fingertip the chosen body points. The subject is then asked to make a cross on the paper where she 'sees' these points in the 'mirror.' After the marking has been finished, the subject turns the back close to the paper. The investigator marks the correct position of the body points and measures the differences with the yardstick (fig. 2 and fig. 3, p. 8).

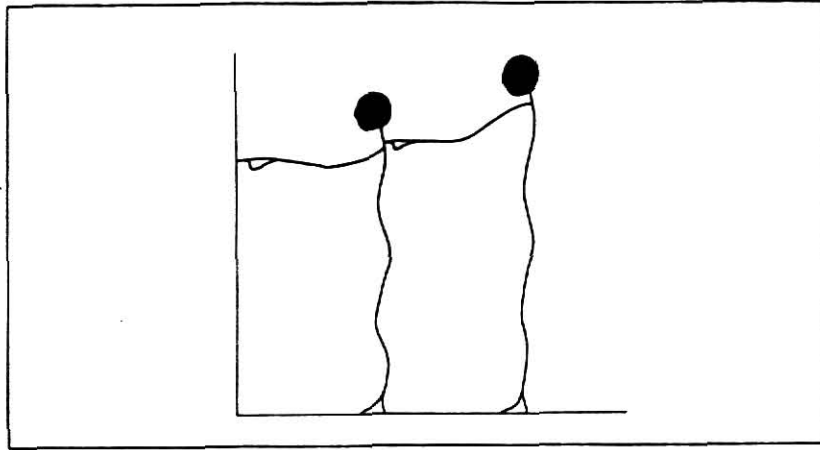


Fig. 2. The method of marking the body points and of putting the markings on the paper (Askevold, 1975, p. 73).

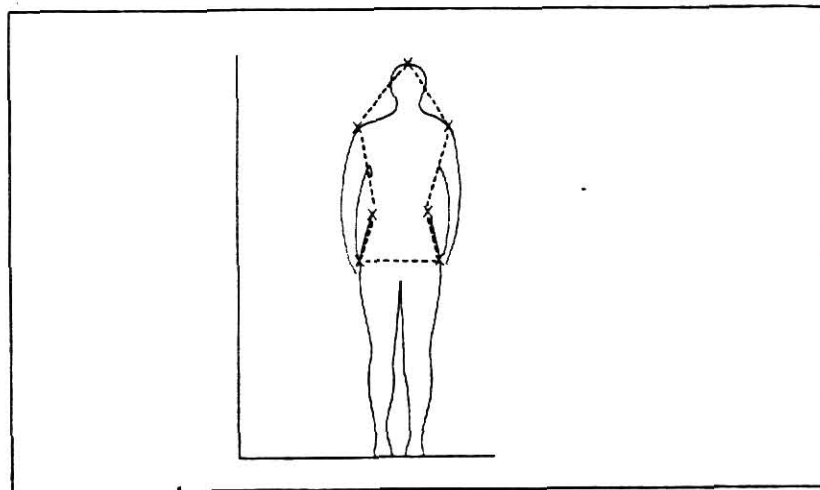


Fig. 3. The body points chosen to be marked (Askevold, 1975, p. 73).

3.4. Television-Monitor-Method

Allebeck et al. (1976) developed a TV-system, which permits a direct simultaneous and exact assessment of a person's body image and also of external objects. The apparatus and the procedure are as follows:

Apparatus

A video-camera is connected to a TV-monitor focusing on the subject who sees her picture in the monitor slightly from the front. The TV-monitor

is modified to allow a remote adjustment of the height/width proportions in the picture. A constant voltage controls the vertical deflection, a variable voltage the horizontal deflection. It is regulated by a remote control allowing the subject to adjust the picture within a continuous range from a 15% vertically compressed picture to a 15% extended one. To the camera is connected a control which regulates the zoom-optique allowing enlargement or reduction of the picture. The subject holds a panel in her hands on which the controls are placed. The adjustments made by the subject are measured electronically and not visible to the subject.

Procedure

The subject is instructed to adjust on the monitor the accurate reproduction of her own image in both natural size and correct height/width proportions. The readings on the scales are noted by the experimenter and then compared with the real size of the subject. The error for a single determination of proportion adjustment is calculated from the formula $s = \sqrt{2d^2/2n}$, where s = methodological error, d = difference between two consecutive determinations, n = total number of measurements (fig. 4, p. 10).

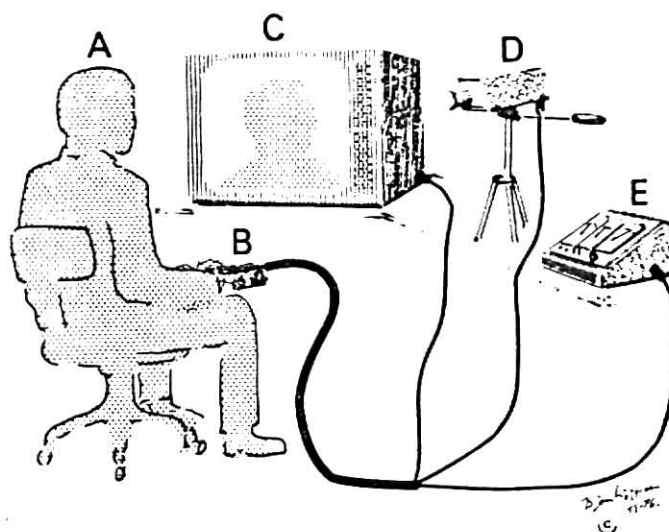


Fig. 4. Schematic illustration of the arrangement of the apparatus. A. Studied subject; B. adjustment panel with subject's controls; C. TV monitor; D, camera; E, reading panel for conductor of the experiment, in reality not visible to the subject. Scales for reading the adjustments of size and proportions. Additional control for conductor's adjustment of proportions (Allebeck, 1976, p. 584).

3.5. Summary and discussion of objective methods

All four techniques yield objective measures of specific body sizes. Additionally, the techniques selected have an influence on research findings. Therefore, an experimenter may choose a technique concerning (1) the complexity of the experimental design, (2) the degree of direct confrontation of the subject with her visual appearance, (3) whether the whole body or body parts should be estimated, and (4) the modus of communication of the estimates.

For instance, the TV-monitor-method and the IMM are the only methods, where the patient does not have to communicate verbally her possibly bizarre perceptions to the experimenter. The IMM allows the patient to make a self-recording of certain body points chosen for measuring. On the

other hand, the subject has body contact with the experimenter, which might cause discomfort or influence her estimations.

The TV-monitor-method gives the patient the opportunity to directly modify the picture of her own body to fit with her idea of it. This method does not allow separate measurements of distortions in different parts of the body. The distorting photograph technique also assesses the distortions of the whole body, but not of specific body parts. Therefore, an investigator using these two methods cannot assess whether the body image disturbance is limited to specific body parts.

In opposite to the movable caliper technique, the distorting photograph method involves a more direct confrontation with the visual appearance of one's body. Both methods require the subject to communicate verbally her estimates to the experimenter. Also, the movable caliper technique does not confront the subject with her actual visual appearance, but requires her to 'transfer' the mental image she has about her body sizes into estimates. This method offers only one visual indirect cue to the subjects: the lights on the horizontal bar which can be moved outward and inward. Therefore, this method seems to demand the greatest deal of abstraction from the subjects. On the other hand, it allows the separate measurement of distortions in different parts of the body.

Another area of concern is the complexity of the experimental design. All methods, except the IMM, require a great deal of laboratory equipment, which might be threatening to the subjects. Especially the TV-monitor-method confronts the subjects with a complex experimental situation. For this reason, the IMM may have distinct advantages over the other techniques. Also, the costs of the research can be reduced using the image-marking-method.

In summary, the distorting photograph technique appears to have less disadvantages than the other methods. And the image-marking-method allows a very quick, simple and inexpensive assessment of body image perceptions. Therefore, these two methods appear to be the most appropriate among the described techniques.

4. Investigations with the objective methods

The objective measurement of body image in anorexics has involved the assessment of specific body sizes using four techniques. This chapter will review the research done with the movable caliper technique, the distorting photograph technique, the image-marking-method and the TV-monitor-method.

4.1. Movable caliper technique (MCT)

Slade and Russell (1973a, 1973b) have carried out cross-sectional and longitudinal studies in order to assess the perception of body image of anorexics (mean age: 19.8 ± 5.8) and of normal female controls (mean age: 25 ± 4.7). The four body sites selected for the studies were those which readily betray the effects of increased weight in broadening the female figure: face, chest, waist and hips. The anorectic patients overestimated their faces (+58%) and their waists (+40%) most. The controls were remarkably accurate in estimating the body widths, but there was a slight tendency towards underestimation. Since the intercorrelations of the four body perception indices were positive and significant, Slade and Russell assumed a general factor of body image perception: that is, in both groups distortion is of a similar magnitude for all parts of the body. The investigators found that anorexics do overestimate the size of a female normal 'model' as well as themselves but to a smaller extent (10-20% overestimation). The accuracy in estimating body widths did not increase if the anorexics could study themselves or the model's image in a mirror prior to size judgments. Unlike their estimates of body widths, the anorexia nervosa patients were extremely accurate in assessing both their own height and that of a model. In addition, they were found to estimate accurately non-body objects, i.e. wooden blocks. Therefore a general perceptual disorder seemed not to be present. The overestimation of body

widths decreased as the patients gained weight during treatment. Moreover, this tendency was greater when the patients gained weight at a slow rather than at a fast rate. It is paradoxical that the thinner the patient becomes, the fatter she appears to herself. She will react by a further avoidance of food: perceptual disorders and abnormal eating behavior have a reinforcing effect on each other. Hence the vicious circle is set up. Finally, the investigators reported that the less accurate the anorexics' estimations were while in the hospital, the more likely they were to relapse quickly after discharge from the hospital. Therefore, the persistence of the perceptual disorder is an indication for a poor prognosis.

Crisp and Kalucy (1974) investigated the extent to which patients report different body widths both before (i.e. at admission to the hospital) and after restoration of the target weight. Each patient's estimation of the head, shoulders, waist, hips and thighs was measured twice, providing an "indicated size" at the first time. Before repeating the measuring procedure, the subject was told by the experimenter: ". . . drop your guard for a moment and tell me again how wide you really judge yourself to be at the various levels" (p. 352). The second measurement yielded the "modified indicated size." Crisp and Kalucy confirmed that anorexic patients overestimate their body widths, especially waist and thighs. The first time body widths were measured, the average overestimate (shoulders excluded) was 65%, but only 45% at the second time, a substantial reduction of the patients' estimates. As the patients gained weight during treatment they seemed to become more realistic and therefore more accurate in their reported estimates. After restoration of the target weight the average estimate was 35% at the first measurement, but only 13% at the second time. However, the tendency to overestimate,

especially waist and thighs, remained. It was not clarified, why the experimenter's invitation to be less defensive might have caused those reduced estimates. Crisp and Kalucy also investigated if overestimation was affected by the ingestion of a meal. Anorexics and controls were asked to estimate their body widths on two occasions (few days apart) before and after a meal. One meal contained normal amounts of readily identifiable carbohydrates; the other was evidently low in carbohydrates, but isocaloric. The controls changed very little in their estimates before and after both meals. But the anorexics reported a remarkable increase of their body widths after the "carbohydrate meal" ($p < 0.05$). The estimates of the face, waist and hips were about 11 to 15% higher after this meal. In contrast to Slade and Russell (1973a, 1973b), the controls were found to overestimate slightly their bodily dimensions. An age factor seems to account for these findings: the normal female population of Crisp and Kalucy's study is younger than that of Slade and Russell. However, the control subjects did not overestimate their body widths to the same extent as the anorectic subjects.

Garner et al. (1976) confirmed these findings: all anorexics, thin and normal controls (mean age of each group: 20.7 years) overestimated their faces, chests, waists and thighs. Garner et al. did not provide means and standard deviations on measures of the specific body widths. But the overall mean overestimation was reported to be between 12% and 27% for all three groups. Also, all subjects overestimated the size of a model at the same four body regions and a non-body object, a vase, at its widest and narrowest points. Subsequent investigations with the movable caliper technique also have yielded inconsistent findings.

Fries (1977) has reported that the caliper device was not able to differentiate between anorexics (mean age: 21 ± 4.8) and normal controls (mean age: 24 ± 3 ; $p < 0.01$). The anorexics satisfied the "Feighner"-criteria for anorexia nervosa. To minimize the amount of data, he presented only the mean of four body indices: head, waist, hips and thighs. Most normal females were found to be very exact in the estimation of their body widths; the total body index of this group was 1.09 ± 0.12 . In contrast, the anorexics were overestimating remarkably; the total body index was 1.36 ± 0.31 ($p < 0.001$). However, Fries pointed out that 5 of the 22 controls did overestimate their bodily dimensions by 21 to 33%. This is about the same degree as that found in anorexia nervosa patients. The magnitude of the behavioral disorder measured by means of an anorectic behavior rating scale was investigated. A positive correlation was found between weight and anorectic behavior: increasing weight seemed to increase the desire to starve oneself; and anorectic behavior decreases with the amount of weight loss. This conclusion is in contrast to Slade and Russell's hypothesis of a 'vicious circle,' previously described.

Using the movable caliper technique, Pierloot and Houben (1978) have studied the body perception of anorexics (mean age: 20.9 ± 3.8) and age-matched psychoneurotic control patients within the first week of admission. The first assessment yielded an "estimated size" of face, shoulders, waist and hips. Then each subject was told by the experimenter that she had overestimated her sizes and was requested to give more correct estimations. Additionally, little more light and a mirror placed near the subject were provided. The "corrected estimated size" was obtained by this procedure. Pierloot and Houben confirmed that the mean perception indices of anorectic patients indicated a marked tendency towards overestimation. The control

group also overestimated the body sizes, but in a less pronounced way. In both groups face and waist were the most overestimated body widths. The mean estimations ranged from 5 to 53% for anorexics and from -8 to 31% for controls. The differences for both groups were significant for all measured widths. The second assessment led to a slight lowering of the perception indices in the anorexia nervosa group, but to a raising in the control group. The mean estimates ranged from -1 to 50% for the anorectic patients and from -5 to 37% for the psychoneurotic patients. The differences between both groups remain significant for the waist only. According to Pierloot and Houben, the raising of the body perception indices in the control group might be explained by "a special meaning attached by them to a direct confrontation with their real appearance" or by "negative suggestibility" (p. 322). In addition, the confrontation of the anorectic patients with their mirror image reduced the overestimation trend, but this tendency was not significant. This finding is in line with the results of Slade and Russell's investigations. Furthermore, the investigators questioned the homogeneity of patients with anorexia nervosa. They found that there is a tendency towards higher standard deviations in the perception indices of this population. That is why they proposed a certain degree of connection between overestimation and individual variability among anorexics.

Agreeing with Pierloot and Houben, Button, Fransella and Slade (1977) subdivided anorexics into occasional vomiters, regular vomiters and non-vomiters. They found that regular and occasional vomiters overestimated their body sizes much more than non-vomiting anorexics. The total body perception index was about 106 for non-vomiters, 120 for regular and 122 for occasional vomiting anorexics. Non-vomiters and regular vomiters

overestimated chest and waist sizes most, whereas occasional vomiters perceived face and chest less accurately. Therefore, Button et al. claimed that perceptual disturbance is not a consistent feature of anorexia nervosa. Body perception may be limited to subgroups of patients and to certain stages during treatment. Button et al. also compared the anorexics as a group (mean age: 23.8 ± 7.2) with normal female controls (mean age: 23.1 ± 3.1) assessing the width of face, chest, waist and hips. Additionally, stomach depth, i.e. the distance from front to back of the body, was estimated. Button et al. did not find significant differences between the anorectic and the control group. Contrary to expectation, the body perception indices ranged from 7 to 31% for the controls, but only from 2 to 23% for the anorexics. Anorexia nervosa patients estimated the width of the hips most accurately, but the greatest overestimation was found to be at the waist and at the stomach depth. In the control group the face was less accurately perceived than either waist or stomach depth. Also, the body perception indices of anorexia nervosa patients were compared when they were underweight and when they were at a more normal weight. Although the estimation of waist and face were less accurate after weight gain, a significant difference did not emerge. This finding contrasts with Slade and Russell's finding that overestimations decreased as the anorexics gained weight. Furthermore, Button et al. carried out correlations between body perception indices and rate of weight gain. No significant correlations were found. Again, they could not confirm Slade and Russell's finding that estimations tend to be more accurate when patients gain weight at a slow rate. It might be possible that the difference between both studies are a reflection of assessments being carried out at different stages during treatment and of different ages of the anorexics assessed.

These factors were taken into account by Casper, Halmi, Goldberg, Eckert and Davis (1979). They examined body image distortions in 79 female anorectic patients and 130 age-matched female controls with the movable caliper technique. All anorectic patients were in the emaciated stage of illness. The size estimations were made at face, chest, waist, hips and "body depth," i.e. the greatest depth from front to back of the body below the waist. Since both groups accurately judged a wooden block, the possibility of a general perceptual disorder was ruled out. Body width estimations exceeded the real size by 9.5 to 27% in both groups. There was no significant difference between anorexics and controls. "Body depth" showed the largest overestimations: +24% in the anorexia nervosa group and even +27% in the control group. Since "body depth" expresses the three-dimensional aspect of the body, this overestimation is probably related to the concern about the largeness of specific body regions. Face and waist were the next most overestimated body parts in both groups. This finding contradicts reports of Slade and Russell (1973a, 1973b). According to Casper et al., the difference might be due to the fact that their own measurements were not taken in a darkened room but in daylight. Like Button et al. (1977), Casper et al. (1979) found large individual differences between anorexics in their body image estimates. The estimates range from a few who see themselves smaller to some who perceive themselves accurately, but with the majority showing overestimation of body width and depth. In line with other studies (Slade and Russell, 1973b; Crisp and Kalucy, 1974), Casper et al. reported that the tendency to overestimate body size was associated with considerable weight gain during treatment, or conversely, patients with considerable weight gain tended to estimate their bodily dimensions more accurately. Also, the larger the weight

loss prior to treatment, the greater was the trend to overestimate body widths. This explains the self-perpetuating nature of the illness: the thinner patients become the less able they are to accurately visualize their size and respond with a greater reduction in food intake. In addition, Casper et al. found that the degree of overestimation was related to the frequency of previous hospitalization, denial of illness, loss of appetite and psychosexual immaturity. Previous hospitalizations that were not successful indicate more resistant anorexic patients. There was a highly significant correlation between the denial of illness and loss of appetite: a loss of appetite might be interpreted as denial of appetite or hunger. However, hunger feelings were found to be experienced by the majority of anorexics (Garfinkel et al., 1974). Casper et al. concluded that these sensations are denied, since the consequences are conflictual and cause anxiety.

Concern about the anorexics' psychosexual immaturity led Ben-Tovim, Whitehead and Crisp (1979) to choose very young women as controls for their investigation. After going through puberty, these adolescents were closer to the anorexics' biological experiences than any control group matched for age would be. Like Crisp (1977), Ben-Tovim et al. perceived the emergence of sexually determined 'fatness' within puberty as an important factor. Therefore, Ben-Tovim et al. suggested that anorexia nervosa represents a flight from biological maturity. However, soon after admission a male experimenter asked the anorexics (mean age: 19.7 ± 3.6) and the controls (mean age: 15.4 ± 0.5) to estimate their face, bust, waist and hips. Although group mean results were not represented, the investigators found that an inverse relationship between accuracy of self-perception and actual body widths exists in both groups. The narrower the subjects, the less

accurate were their estimations. Other investigators also found that the lighter subjects overestimated themselves more than the heavier ones (Slade and Russell, 1973; Casper et al., 1979). In contrast, Button et al. (1977) did not find a change in anorexics' self-estimates during weight gain.

Halimi, Goldberg and Cunningham (1977) offered a possible explanation for these discrepant findings. They investigated the distortion of body image in eighty-six normal-weight adolescent girls. There were 10 girls at each age level (10-18) except ages 14 (seven volunteers) and 17 (nine volunteers). Halimi et al. found an inverse relationship between age and body size overestimation with the caliper device. They suggested that the ability to determine body image accurately involves a perceptual maturational development. Therefore it is likely that emaciated patients have regressed to an earlier stage of 'perceptual maturity.'

Methodological factors which might have influenced the research on body image disturbances, are discussed in the chapter 'general research problems.'

4.2. Distorting Photograph Technique (DPT)

Garner, Garfinkel, Stancer and Moldofsky (1976) applied the distorting photograph technique to the study of body size perception in eighteen anorexics, sixteen thin and sixteen normal controls. The average body age of each group was about 20.7 years. Approximately one-half of the anorexic subjects overestimated their body size, while the other half underestimated similar to both control groups. The tendency to overestimate did not extend to estimations of a standard female figure or an inanimate object. The normal and the thin controls showed an absolute underestimation of their body widths, that is only one subject in each group overestimated her body size. Each subject was also required to adjust the photograph of herself

to her ideal size. All groups preferred to be thinner than their perceived size.

Two personality tests, the 'Eysenck Personality Inventory' (EPI) and 'Rotter's Locus of Control Scale' were administered to all subjects. The EPI purports to measure introversion versus extraversion and neuroticism versus stability. Only in the anorectic group were the degree of neuroticism ($r = 0.57$, $p < 0.01$) and lack of self-control ($r = 0.47$, $p < 0.05$) significantly related to overestimation. In addition, when the anorectic group was subdivided into overestimators and underestimators, the overestimators were found to be significantly more neurotic than the underestimators ($p < 0.05$, two-tailed test). Contrary to Slade and Russell's finding (1973), Garner et al. did not find that body size estimation was related to the degree of emaciation in the anorectic patients. The tendency towards overestimation of oneself is not a function of weight *per se*, but rather is specific to subjects with eating disorders, since it was not found in the control group of thin subjects.

Garfinkel, Moldofsky, Garner, Stancer and Coscina (1978) confirmed that anorexia nervosa patients (mean age: 20.8 ± 0.7) overestimated their bodily dimensions. But the age-matched controls were almost exact in self-estimates. Eight of the 26 anorexics, but only one of the 16 controls showed greater than 10% overestimation. Intersubject variability in regard to self-estimations was greater in anorexia nervosa patients. The striking finding was the marked consistency in estimating body size on two occasions: the anorexics showed a high positive correlation on measures from one week to the next ($r = 0.75$, $p < 0.001$), indicating a stable disturbance over a brief period. This correlation was lower for the control group ($r = 0.45$, $p < 0.05$). The self-size estimates were not altered by allowing the

anorectic and normal subjects to look at one's image in a mirror prior to judgments. Similarly, the ingestion of both a high and a low calorie connotation meal did not alter perception of body size for either group. The correlations between self-image estimates before and after meals were high, revealing the consistency of body image in anorexics (high calorie connotation meal: $r = 0.90$, $p < 0.001$; low calorie connotation meal: $r = 0.86$, $p < 0.001$). In contrast, Crisp and Kalucy (1974) found that anorexics, but not controls, overestimate their body widths much more after the consumption of a high carbohydrate meal in opposite to an isocaloric low carbohydrate meal. According to Garfinkel et al., this might be due to the use of different assessing methods or to differences in the quality of the meals.

One year later, Garfinkel et al. (1979) retested the patients and controls. Anorexics subjects showed significantly greater variation in body width estimates than controls ($p < 0.001$). Both initially (1978) and on follow-up (1979), the anorexics tended to overestimate their body sizes. This stability in visual self-perception was apparent for those who showed considerable weight gain, and is in contrast to Slade and Russell's (1973a) finding. But those anorexics who maintained a significant weight gain to average weights, began to wish to be thinner again. In contrast to the anorexia nervosa patients, there was a lack of correlation in body size estimates over time in the normal controls. The investigators suggested that a variety of factors including self-esteem, affect, phase of menstrual cycle and overall maturational process may have played a role.

In another study Garfinkel, Moldofsky and Garner (1977) assessed the self-perception of 28 anorectic patients (mean age: 20.2) who met the 'Feighner' criteria for anorexia nervosa. It was found that the group as

a whole slightly overestimated their sizes with a mean of $0.47\% \pm 1.25\%$. They exhibited a broad scatter of estimations: thirteen patients did underestimate their size and fifteen patients were overestimators. Also, Garfinkel et al. described the patients' clinical status using a global clinical scale. It reflects weight, eating habits, social and vocational adjustments and menses. The lower the scores on the scale, the better the outcome. Five patients had "poor" outcomes, eleven "symptomatic," eight "much improved" and four "excellent" outcomes. All patients with excellent outcomes underestimated their sizes, whereas all five poor outcomes were overestimators: the self-estimates were highly correlated with global scores on follow-up and final weight: those with higher final weights and lower final scores had tended to underestimate their bodily dimensions. Compared with patients who underestimated ($n = 13$), overestimators ($n = 15$) had more prior hospitalizations and scored higher on both initial and final assessment. In contrast to the underestimators, the overestimators showed only little change in their global scores. They were the patients with poor outcome. Therefore, these results emphasize the importance of self-perceptual disturbances as prognostic indices in anorexia nervosa.

4.3. Image-Marking-Method (IMM)

Wingate and Christie (1978) reported that the image-marking-method differentiated between anorectic and normal females, matched for socioeconomic class and age (mean: 20.8). The differences in the perception of body width between these groups were significant. Anorexics overestimated shoulders, waist and hips, the greatest overestimation being at the waist. The mean estimates ranged from 9 to 28%. The controls slightly overestimated at the waist (+4.3), but underestimated width at the other body parts. The mean estimates ranged from -8 to 4.3%. Both groups estimated

height accurately. This finding is in accordance with the report of Slade and Russell (1973a), supporting the suggestion that the perceptual disorder of anorexics relates only to horizontal body dimensions. Furthermore, they showed that low ego strength of anorexics measured by the ego-strength- (E_s -) scale of the 'Minnesota Multiphasic Personality Inventory' (MMPI) was reflected in distortions of body image. The differences in the E_s -scores of anorexics and controls with mean values being 36.6 and 45.6 respectively were significant ($t = 3.94$, $p < 0.001$). Wingate and Christie also found that a further control group (C_2) with a low mean E_s -score of 37.06 showed a tendency of overestimation of all sites which fell between the anorexic and the first control group. Comparing the C_2 -group with the anorexic group, the overestimation of the waist only was significantly greater ($t = 5.99$, $p < 0.001$) in the anorexic group. Wingate and Christie pointed out that the younger mean age (17.4) of the C_2 -group might have contributed to this finding.

In another study anorexia nervosa patients were also found to overestimate their body widths more than controls (Pierloot and Houben, 1978). The patients overestimated their waists most (+38%). The body perception indices of anorexics obtained by this method differ only little, without significance, from those found by the movable caliper method (Pierloot and Houben, 1978). The total body perception index was 124.8 ± 25.3 in the anorectic group, but 108.9 ± 15.2 in the control group. However, the controls were least accurate in estimating the width of their hips. The total body perception index for hips was significantly higher using the image marking method (IMM: 122.6 ± 19 ; MCT: 106.5 ± 19 , $p < 0.01$).

Meermann (1983) also found the known overestimation of bodily dimensions in both anorexics (mean age: 18.8 ± 4) and age-matched controls,

gymnastics and ballet pupils. The mean body perception indices (mBPI) were computed from the estimates of the "body frontal" (cheeks, shoulders, waist, trochanters, thighs, calves), "body sagittal" (nose-occiput, chest-back, umbilicus-back, abdomen-max. glutaus, thigh and calves) and the head. The mBPI of "body sagittal" was 117.9 ± 16.3 for the anorexics, but 111.3 ± 13.4 for the controls. In the anorexic group the overestimation was greatest at cheeks (+40%), thighs (+23%) and waist (+17%), whereas the controls overestimated cheeks (+43%) and trochanters (16%) most. The mean BPI for "body sagittal" was significantly higher in the anorexic group (114.4), compared with the controls (104.2; $p < 0.02$). The overestimation was greatest at 'umbilicus-back' and 'abdomen-max. glutaus.' It supports Casper's et al. (1979) finding that these overestimations are related to the subjects' concern about the largeness of certain body regions.

In contrast to these reports, Strober, Goldenberg, Green and Saxon (1979) did not find significant differences between anorexics and controls estimating their body widths. He compared anorexia nervosa patients (mean age: 14.7 ± 1.0) with age-matched psychiatric inpatient controls (mean age: 15.1 ± 1.3). The patients were tested following admission (T_1) and again six months later (T_2) in the recuperative phase. On both occasions both the anorectic subjects and the psychiatric patients overestimated body sizes (shoulders, waist, hips) to a similar degree. At T_1 , the mean estimates ranged from 11 to 30% and 5 to 21% for anorexics and controls respectively; and at T_2 from 10 to 25% and from 6 to 22%. Waist and hips were overestimated most by both groups. The intergroup differences of all body widths were not significant both at T_1 and at T_2 . Strober et al. observed only little differences between body size judgments obtained when the patients were emaciated and when their weight was normal, but in the

recuperative phase the anorexics estimated the waists more accurate. This accords with Button et al. (1977) who failed to observe differences after anorexics had gained weight.

Also, Garner et al. (1976) found that the psychiatric patient control group showed results similar to the thin and the normal-weight controls: almost all subjects underestimated their body widths. Body image disturbances do not appear to be a function of psychiatric disturbance in general.

4.4. Television-Monitor-Method

Meermann (1983) used this technique to assess the body image perception of anorexics and age-matched controls, gymnastics and ballet pupils. The controls deviate slightly by $8.5 \pm 6.1\%$ from normal body weight, whereas the anorexics deviate by $18 \pm 8.5\%$ (Metropolitan Life Insurance Company, 1959). The mean body perception indices were computed for the estimation of "body frontal," "body sagittal" and of the head (see previous description, page 26). Both groups underestimated their own body dimensions. In the anorexia nervosa group the underestimation was greatest at "body sagittal" (mBPI: 92 ± 13) and smallest at the head (mBPI: 98 ± 11). Interestingly, the controls underestimated all body sizes much more than the anorexics: the smallest underestimation was found to be at the head (mBPI: 90 ± 8). In the control group, age was not an important factor contributing to body size estimation. But anorexics under 18 years were more accurate in self-estimation than anorexics above 18. Meermann concludes that "by neglecting the objective standard (the non-distorted video pictures of the subjects) and comparing only mean differences, the anorexics deliver significant overestimation" (p. 95). It could not be clarified whether underestimation was due to methodological problems of this technique.

4.5. Summary and discussion of the investigations

The investigators used several objective methods in an attempt to document and quantify clinically observed body image disturbances of anorexia nervosa patients. Despite the various advantages of these techniques, there are some methodological shortcomings in regard to the selection of the subjects and to the experimental situation.

Many studies do not provide a detailed description of the anorexic and the control groups. Often, the diagnostic criteria for selection of the patients are not clear. Important characteristics of the subjects such as the socio-economic status, education and family history are rarely presented. Also, the factors 'vomiting,' 'stage of illness' and 'subject age' influence the estimation of bodily dimensions. But they are not controlled by all investigations. However, this may be due to the fact that the heterogeneity of anorexia nervosa has only recently been emphasized (Garfinkel et al., 1980). Most investigators have matched anorexics and controls on age, but they have not considered other variables such as dietary restraint prior to the experiment or 'hidden' psychopathology.

The experimental situation also influence the outcome of the investigation. The laboratory setting, the equipment utilized and the procedure itself may be threatening to some subjects. This might explain why the empirical studies using the image-marking-method yielded inconsistent findings. Some investigators reported significant differences in the body perception between anorexics and controls. Others found the known overestimation in both anorexics and controls. Overestimation was found to be associated with low ego strength and age. However, in two studies the subjects had to estimate their body sizes standing undressed in front of the experimenter (Pierloot and Houben, 1978; Strober et al., 1979). It is

likely that this situation caused discomfort and influenced the subjects' estimates. Since Wingate and Christie (1978) did not report whether the subjects were dressed or not, it is more difficult to consider differences in the analysis of the research results. In addition, several investigators reported about psychosexual immaturity of the patients. Therefore, the gender of the experimenter should be considered even more as an important factor--especially in experimental situations where the subject is required to be undressed. Unfortunately, only few studies indicate the experimenter's gender.

The studies using the movable caliper technique in order to assess the body image disturbances have also yielded inconsistent findings. Some investigators found that only anorexics overestimate their body sizes. Others reported that the movable caliper technique is not able to differentiate between anorexics and controls. Both populations overestimated their bodily dimensions, but the anorexics to a greater extent. Overestimation was found to be associated with the rate of weight gain, the ingestion of a meal, age of the patient, frequency of previous hospitalization, denial of illness and psychosexual maturity. Also, certain stages of treatment and subgroups of patients (vomiting/non-vomiting) appear to be of importance for the anorexics' self-perceptions. Unfortunately, these factors are not controlled by all investigations. This may be partially due to the fact that the investigators have only recently made attempts at distinguishing stages of treatments and subtypes of anorexia nervosa. However, it is quite possible that the failure to consider these factors in the experimental design resulted in these inconsistent findings. Another area of concern is the use of different machines: Button et al. (1977) reported that a manually controlled apparatus had been replaced by

an electrically operated apparatus during the same investigation. Additionally, the assessment of body image perception using the movable caliper technique was carried out in two different hospitals. Button et al. found significant differences ($p < 0.05$) between the groups assessed at different hospitals. According to the investigators, it "remains unclear to what extent this difference is a reflection of treatment differences, differences in illumination, apparatus differences . . ." (p. 241). Casper et al. (1979) also suggested that illumination is a factor which has to be taken into account in the investigations of body size estimation. However, most studies have failed to report details of the lightening. In conclusion, the investigators should use standardized experimental conditions in future studies in order to facilitate the analysis of research results.

In contrast to the studies using the MCT or the IMM, one team of investigators only applied the distorting photograph technique to the assessment of body image. Garner, Garfinkel, Moldofsky and Stancer found almost no overestimation in control groups. The controls were either exact in their estimations or underestimated their body sizes. The anorexics exhibited a broad scatter of estimations: they overestimated or underestimated their body sizes. Self-perception was associated with a lack of self-control and neuroticism. However, the homogeneity of the findings is relatively high. This might be due to the fact that the distorting photograph method involves a more direct confrontation with the visual appearance of one's body than the MCT or the IMM. Also, since the same team was carrying out the investigations, it is likely that the differences in the overall experimental design were small. On the other hand, it is important to stress that not all anorexic patients overestimated their body sizes. Underestimation was also reported. Again, because of the

individual variability of body size estimates, it doesn't seem appropriate to compare the anorexics as a whole group with control groups. The reported underestimation might also indicate, that the anorexics are partially aware of their extreme thinness. In addition, the underestimating anorexics were found to improve much more during the treatment than overestimators. This supports the suggestion that awareness of one's body is the main "key" for a successful treatment and recovery of anorexia nervosa.

Finally, the TV-monitor-method, which permits a direct simultaneous and exact assessment of a person's body image, did not differentiate between anorexics and controls. Both groups underestimated their own body dimensions. Contrary to expectation, the controls did so to an even greater extent than the anorexics. Unfortunately, only one investigator (Meermann, 1983) has just recently used this method, so that a comparison between different research results is not possible. However, it is likely that the found underestimation is due to methodological problems. This technique requires the greatest deal of laboratory equipment, which is probably threatening to the subjects. It remains doubtful, whether such a complex experimental design is necessary to assess body perceptions in anorexics. The other more simple techniques also provide information about body perceptions, and they are satisfactory for the diagnosis and the evaluation of the treatment.

However, despite some inconsistencies in the findings, the bulk of evidence supports that body image disturbance is a cardinal feature in anorexia nervosa. Also, these methods are reliable, since they yield relatively consistent data for the measures of the specific body sizes. Positive and mostly significant intercorrelations between the estimates of

different body sizes on the same test occasion have been reported by several investigators (range: $r = 0.25-0.95$) using the movable caliper technique and the image-marking method (Button et al., 1977; Pierloot and Houben, 1978; Strober et al., 1979). Garfinkel et al. (1978) using the distorting photograph technique reported that self-estimates of anorexics were found to be reliable over one week. In addition, the body perception indices obtained with the image-marking technique were only slightly different (n.s.) from those obtained with the movable caliper technique. Unfortunately, the correlation between the measures were not presented (Pierloot and Houben, 1978).

In summary, there are various methodological shortcomings, which are partially responsible for the inconsistencies in the research findings. Although the shortcomings do not question the fundamental significance of previous studies, those potential sources of bias should be controlled in future studies.

5. Methods and investigations of subjective measurements of body image

In contrast to the four previously described techniques, questionnaires and interviews do not yield results which are verifiable. They are helpful for assessing the anorexics' subjective experience of body image. Projective techniques (human-figure-drawing) are also used to study the patients' attitudes and feelings about their own bodies.

5.1. The Fisher Body Distortion Questionnaire

This self-report measure consists of 82 items depicting a variety of body image aberrations: perception of body parts as large or small, loss of body boundaries, blockage of body openings, body depersonalization and unusual skin sensations. The questions can be answered with yes, no and undecided. This measure is unrelated to intelligence, social desirability and acquiescence, and differentiates between normal and psychiatric patients (see Appendix C). Strober et al. (1979) used this questionnaire to assess the subjective experience of body image distortions of anorexics (mean age: 14.7 ± 1.0) and age-matched psychiatric patients on two occasions: immediately after admission (T_1) and six months later (T_2) during the recuperative phase. The questionnaire was not related to admission weight, extent of weight loss and duration of illness. Anorexics differed from controls by reporting on both occasions more aberrant experiences, particularly on items related to estrangement from the body ("I feel distant from my own body"), vulnerability of the body to outside intrusions ("I feel my body is unprotected") and concern over excessive weight ("My body feels unusually heavy") and stomach blockage. The last two items showed little persistence in the anorexics past T_1 suggesting that desensitization happens rapidly once normal weight is restored. But several of their experiences persisted into the post-acute phase (T_2) of

their illness, especially estrangement from the body and weakness of body boundaries. Also, the anorexics were subdivided into non-vomitters ($n = 11$) and vomitters ($n = 7$) in order to determine the effect of this feature on body image scores at T_1 and T_2 . Strober et al. found that vomiting did correlate positively at a near significant level at T_1 ($r = 0.40$, $p < 0.10$), and at a significant level at T_2 ($r = 0.49$, $p < 0.05$). Vomitters seemed to harbour more bizarre notions about bodily sensations and food, using vomiting as a radical strategy to control body functioning.

5.2. Human-Figure-Drawing

According to Witkin, Faterson, Goodenough and Karp (1962), the subjects are instructed simply to draw a picture of a female person. The drawings are scored on a 5-point-scale for degree of differentiation of the body concept. This method is based on the principle that development proceeds from a state of undifferentiation to a state in which components of behavioral systems are unified into a coherent structure. Therefore, the most sophisticated drawings (scale score 1) show a high form level (realistic shaping and proportioning of body features), a clear differentiation of sexual characteristics and higher levels of detailing (facial features, clothing). On the other hand, scale scores 4 and 5 are given to very low differentiated drawings.

Strober et al. (1979) applied this method to the study of body size perception of anorexics and age-matched psychiatric controls. Anorexics were found to demonstrate less differentiation than the controls, both at admission (T_1) and six months later (T_2). But the differences were not significant ($p < 0.10$). Also, there were no statistically significant correlations of body image scores with the duration of illness, admission weight and percentage deviation from normal weight. Despite the fact that

this investigation only identified trends ($p < 0.10$), it is of interest that empirical research with this method observed a relation between psychological differentiation and personality functioning. Individuals who exhibit greater passivity in social relations focus more on external cues to govern their behavior, tend to produce less differentiated drawings. However, Strober et al. did not yet infer from the obtained results a relation between differentiation and personality functioning in anorexia nervosa. They recommended further investigations in this field.

5.3. Questionnaires/clinical experiences

Buvat-Herbaut et al. (1983) used a 68-item-questionnaire to assess the body perceptions of eighty-one anorexia nervosa patients (age: 14 to 27 years) and 288 age-matched controls (C). The anorexia nervosa group was divided into anorexics at the emaciated state (ANE) and into anorexics gaining weight (AN-GW) at the time when they filled the questionnaire. In contrast to the previous mentioned investigations, the anorexics were questioned about the way in which they experienced their body as a whole. Buvat-Herbaut et al. found that fewer anorexics than controls perceived their body size as normal (C = 50.7%, ANE = 19.2%, $p < 0.001$; AN-GW = 24%, $p < 0.05$). The proportions of the girls who felt too big did not significantly differ in the three groups. More women were concerned about the largeness of a part of their body than about the whole body. The investigators also reported that denial of illness represented an initial posture of many anorexics. But this was reduced once a sound therapeutic relationship was established. About 26.9% of the emaciated anorexics estimated that they were too thin for their whole body, but 40% of the patients gaining weight. Only a few controls perceived themselves as too thin (C = 0.7%). Therefore, Buvat-Herbaut et al. concluded that unlike

body size overestimation, which is frequent in normal controls, thinness misperception is induced by the overestimation and is specific for anorexics only. In addition, the way in which anorexics experienced their body before weight loss (BWL) was examined. The proportion of girls who felt too big before weight loss was the same in both groups (ANE-BWL = 85%, AN-GW-BWL = 87.5%). Before weight loss, more than 37% of the anorexics perceived only one part of their body as too big. But at the time of the study, less than one-third of them did so (ANE-BWL = 37.7%, ANE = 32.7%; AN-GW-BWL = 45.8%, AN-GW = 28%). Although more anorexics thought they could estimate their body accurately, 40% (ANE) to 50% (AN-GW) weighed themselves at least once a day. This may indicate that they were not sure about their ability to perceive the body weight, or that this checking is an obsessive ritual. Furthermore, the presented data demonstrated a fundamental conflict of anorexics: although more than one-third of them wished to gain weight, about 80% also feared to gain weight. The women of the anorexic groups expressed their fear of not being able to stop their weight gain (ANE = 86%, AN-GW = 89%, C = 68%, $p < 0.05$) and to weigh the ideal weight for their height (ANE = 92%, AN-GW = 76%, C = 23.5%, $p < 0.001$). Bruch (1962, 1977) also reported about their fear of loss of control and a sense of helplessness. Slade and Russell (1973) confirmed that some of their patients expressed fear of uncontrolled eating and the risk to become grossly obese. These feelings are countered by the anorexics by complete skill mastery (for instance in athletics) and extreme self-discipline (excelling schoolwork). Many experience themselves and their bodies as separate entities: ". . . to have control over your body becomes your very own kingdom where you are the tyrant, the absolute dictator" (Bruch, 1978, p. 65).

Crisp and Kalucy (1974) provided clinical case material in their report to illustrate the anorexics' body perceptions. One woman reported that she could not stand clothes close to her skin because it made her aware of her fatness. Also, she described her hands as large and clumsy and her tongue as swollen. Another anorectic woman feared to become as obese as her aunt: "Then I'll be fat all over, . . . I'll have big thighs and hips" (p. 359). Similarly, some of Bruch's patients expressed their fear to "have a womanly body, round and full developed" (1978, p. 85).

However, on the basis of their clinical experiences, most investigators found that anorexics cannot 'see' how thin they are. Although they deny emaciation, they consider it their supreme achievement.

5.4. Summary and discussion of subjective measurements

The questionnaires, interviews and projective technique yielded findings indicating that anorexics have distorted feelings and attitudes about their own body. The patients perceived their body as a foreign object. They have repeatedly conveyed a sense of not having control or ownership of their own body. Although some anorexics expressed their fear of excessive weight gain and of having a womanly round body, these patients also paradoxically wished to gain weight. It is not clear, whether this is really a fundamental conflict of these anorexics. It is possible that the pressure of parents, friends and the medical staff to gain weight is so strong that the anorexics give in and finally express 'their' wish to gain weight. On the other hand, these anorexics might be aware of the life-threatening consequences of their emaciation and do want to put on weight. This insight and the remaining fear of losing control and becoming fat might evoke the conflict reported.

Also, since the subjects report subjective experiences and attitudes, which might vary widely among the individuals, the reliability of these methods cannot be as high as that of objective methods. On the other hand, objectivity is not the only criterion of reality. There is also a subjective reality based on feelings, and this reality should not be ignored or denied. Therefore, the subjective methods for the measurement of body image disturbances are highly valuable for diagnosis and treatment of anorexia nervosa.

6. Attitudes toward menstruation, pregnancy and sexuality

The onset of anorexia nervosa is reported to be in most cases during puberty. Early adolescence may expose the individual to physical, emotional and cognitive demands, which she is not yet capable to meet. Sexuality, menstruation and pregnancy are basic body functions of the mature females. Therefore, distorted attitudes toward these functions may reflect the anorexics' body image disturbances.

6.1. Menstruation

Amenorrhea is a characteristic feature of anorexia nervosa. Since the onset of this eating disorder is reported to be in most cases during puberty, Crisp (1977) suggested that anorexia nervosa involves an avoidance of biological maturity in response to the expectations, demands and conflicts of "female adulthood." Therefore, the overestimation of one's body widths may represent a regression to a pre-menarchal perception of one's body image (Ben-Tovim, 1977). Menarche, and the body fat required for this, represents the significant changes associated with adulthood. It is a crucial event forcing the female to confront and reorganize her body image and sexual identity (Whisnant and Zegans, 1975). For most anorexics, amenorrhea is related to the degree of weight loss and percentage body fat. It was estimated that for the onset of menarche body fat must constitute about 17% of body weight. Also, about 23% fat is needed to maintain normal reproductive functions (Frisch and McArthur, 1974). In addition, the menstrual cycle can be interrupted by environmental stress.

Research done to investigate attitudes toward menstruation and pregnancy is limited for both anorexic women and healthy women. Therefore, it is difficult to decide to what extent anorexics are exceptional as compared with healthy women. However, Beumont, Abraham and Simson (1981)

studied attitudes towards menstruation and pregnancy of 31 Australian anorexics (mean age at interview: 21.8 ± 4.3). The patients were divided into 'dieters' and 'vomitters.' Dieters used only dieting and excessive exercise to lose weight, but vomitters deliberately vomited or used purgatives as an adjunct to dieting. The investigators found that the two groups did not differ significantly in respect to age at menarche (13 ± 1.5), at interview, and of menstrual knowledge.

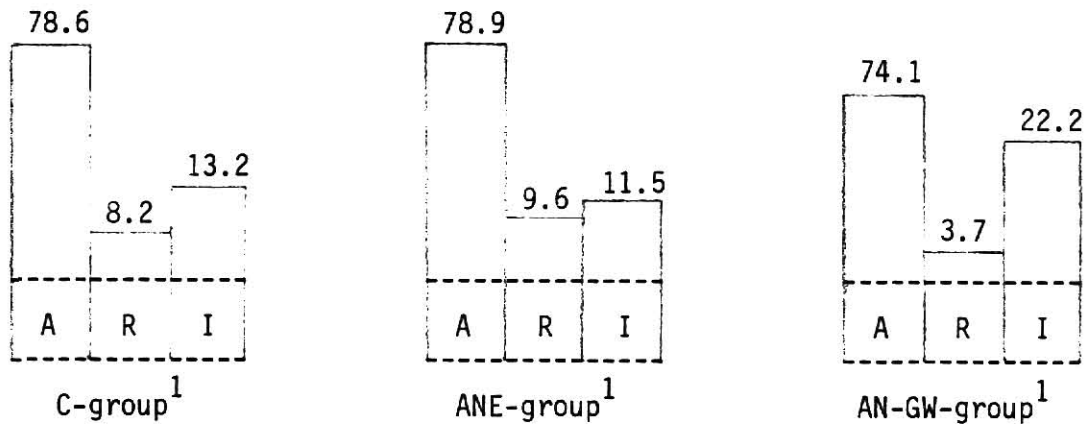
Eight anorexics were not satisfied with the preparation they had received for menstruation. They reported that either their mothers were embarrassed when talking about sexual matters or that they themselves had avoided all attempts by their mothers to discuss sexual topics.

More than half the patients used tampons for menstrual protection; dieters were found to use them more frequently than vomitters did. According to Beumont et al., "it may possibly indicate a tendency to avoid direct involvement in sexual situations" (p. 139).

Eight patients expressed a positive attitude towards menstruation, since it made them feel grown up. In addition, these women were distressed by their amenorrhea. Finally, a negative attitude towards menstruation was found in nine patients: they perceived menstruation as messy and dirty and were relieved at its cessation. The remaining patients considered periods as nuisance, but also emphasized that they made them feel normal and able to bear children.

Buvat-Herbaut, Hebbinckuys, Lemaire and Buvat (1983) also claimed that the attitudes toward menstruation reflect the body image disturbances of anorexics. They assessed eighty-one French anorexia nervosa patients (age: 14 to 27 years) and 288 age-matched normal controls by a questionnaire. The investigators found that the proportion of girls who wished to

menstruate was the same in the control group (C), in the emaciated anorexics (ANE, n = 54) and in anorexics who were gaining weight (AN-GW). The following figure shows how many girls of each group appreciated, refused or remained indifferent towards menstruation.



¹C-group: control group
 ANE-group: emaciated anorexics
 AN-GW-group: anorexics gaining weight

Fig. 5. Appreciation (A), refusal (R) and indifference (I) of the C-group, ANE-group and AN-GW-group toward menstruation (%).

In addition, Buvat-Herbaut et al. found that their motivations for menstruating were different. They are demonstrated in table 1.

Table 1. Motivations for menstruating in the C-group, ANE-group and the AN-GW-group¹ (%).

Motivation	C	ANE	AN-GW
to feel normal	29.6	19.0	25.9
to feel like a woman	45.3	50.0	44.4
to have children	78.6	78.9	74.1

¹C-group: control group
 ANE-group: emaciated anorexics
 AN-GW-group: anorexics gaining weight

These results emphasized that in the majority of cases, anorexia nervosa does not signify an absolute refusal of the adult female body.

6.2. Pregnancy

Since pregnancy with its change of body size and body shape and the anorexic's pursuit of thinness contradict each other, the patient's attitude toward pregnancy was studied.

Beumont, Abraham and Simson (1981) examined 31 Australian anorexics (mean age at interview: 21.8 ± 4.3). They found that eleven anorexics expressed a negative attitude toward pregnancy. With one exception, these patients were at age 22 to 34, and almost all of them also had a negative attitude toward menstruation. They reported that they were afraid of the pain of childbirth or of change in body shape during pregnancy. One woman even expressed that a pregnancy would absolve her from the need to maintain a perfect figure. Another patient would appreciate delivery since 'the load will be gone then.' On the other hand, thirteen patients had a positive attitude toward pregnancy and seven were found to be ambivalent.

Additionally, Buvat-Herbaut et al. (1983) reported that more anorexics than controls were afraid to be pregnant having an enlarged stomach ($C = 14.7\%$, $ANE = 20\%$, $p < 0.05$; $AN-GW = 19\%$, n.s.). Especially the anorexics in the emaciated state (ANE) were disgusted by this idea. But it must be noted that these feelings concerned less than 20% of the anorectic girls.

6.3. Sexuality

Since puberty is the characteristic time of onset of anorexia nervosa, it is often alleged that this disorder results from a failure to cope with problems of puberty, particularly conflicts over sexual feelings

and behavior. Although anorexics are described often as psychosexually immature, there have been few attempts to record systematically the psychosexual histories of anorexia nervosa patients. However, as early as in 1873, Lasègue mentioned difficulties in heterosexual relationships as a precipitant of the illness. Freud (1902) stated that loss of appetite is, in sexual terms, loss of libido (Beumont, Abraham, Simson, 1981). In recent years the research investigating the psychosexual history of anorexics increased quite rapidly. Bruch (1962) considered the failure of sexual functioning as one area of perceptual deficiency in anorexics. Also, the overestimation of body widths was found to correlate with a slow psychosexual development (Casper et al., 1979; Ben-Tovim, 1979).

Beumont et al. (1981) was interested in the sexual behavior, knowledge and attitudes of Australian anorexia nervosa patients. They reported that anorexics ($n = 31$) showed a wide spectrum of sexual experience, knowledge and attitudes. They compared vomiters and dieters, finding that a higher proportion of the vomiters had experienced intercourse and had more than one sexual partner. But there was no other significant difference between the groups in respect of sexual matters. Beumont et al. reported that 20 patients had a poor knowledge of sexual matters (sexual functions/contraception). Half of them spontaneously expressed dissatisfaction with their mothers for not instructing them adequately. Also, six anorexics deliberately avoided reading sexual material, whereas five sought sexual literature. Masturbation was perceived as dirty and abnormal by seven women, but fourteen approved it saying that it is a normal, healthy activity. Thirteen anorexics expressed a positive attitude towards homosexuality, but eight women said it was perverse and abnormal. Furthermore, in 14 cases, first sexual intercourse had occurred prior to

the anorexia nervosa. Six had first intercourse after their illness had become established. Most patients evaluated their experience of first sexual intercourse unfavorably. They described it as painful, disgusting or as a 'non-event.' About one-third of these anorexics said that they regretted ever having intercourse. Sexual problems were seen by thirteen patients as major precipitants of their illness. They reported guilt feelings and anxiety about sexual activity. Another problem was the insistence by their boyfriends that they have sexual intercourse. Also, the parental disapproval of a boyfriend caused sexual problems. Five patients even referred to ongoing sexual problems as factors which maintained their anorexic behavior. These were for instance marital conflict, guilt about intercourse and embarrassment due to having breasts of unequal size. Beumont et al. also found that 12 out of 20 anorexics changed sexual partners, because they 'did not want to be used,' 'lost interest' or because of parental disapproval. Bruch (1977) also reported about the dependence of anorexics on parental disapproval or support. Finally, Beumont et al. found that the effect of the illness on actual sexual behavior was variable. Only two patients believed that their libido and sexual interest had not changed after losing weight. But the remaining anorexics felt that their libido had definitely decreased: they reported cessation of masturbation, loss of sexual interest in men and overall lack of interest in sexual matters.

Casper et al. (1980) confirmed this finding. They reported that the decrease in sexual interest since the onset of anorexia nervosa was significantly greater in the bulimia group than in the restricting group. According to a German study (Rost, Neuhaus, Florin, 1982), women with 'bulimia nervosa' appear to exhibit significantly greater fear of not

corresponding to the sexual wishes of their partners than normal controls.

Sexual activity seemed to be related to the type of weight-losing behavior, e.g. vomiting and purging as opposed to dieting: Beumont et al. (1982) pointed out that the vomiting anorexics were more sexually active, although the sexual knowledge and attitudes were not recognizably different between restrictors and vomiters. Therefore, they studied psychosexual histories of anorexics again in order to provide a more detailed classification of these histories in context to the eating disorder. Four fairly distinct groups could be discerned; group 1 and 2 only accounted for 56% of the subjects studied, and group 3 for 30%.

The patients of group 1 were characterized by their denial of their own sexuality and by minimal psychosexual development. They were almost exclusively dieters, reaching extremely low weights. They expressed negative attitudes towards menstruation, intercourse and puberty. Their sexual knowledge was small; they had little or no sexual experience. Also, they avoided looking at their bodies in a mirror.

The anorexics of group 2 used dieting and exercising to lose weight; vomiting and purging was mild and often transient. Beumont et al. found that they have many conflicts about their sexual behavior and their feelings. They also fear vaginal examination and sexual intercourse. Sometimes they looked at their bodies in a mirror, but were shy about it. They were anxious to talk about sexual topics.

In contrast, group 3 consists mainly of vomiters and purgers. Often their disturbed eating behavior led them to terminate relationships. They craved for a relationship, but wanted to be 'held' rather than have sexual intercourse. Their avoidance of looking at their bodies appeared to depend on their weight at that time. Since they felt guilty and often

denied sexual encounters, this group was the most difficult to take a sexual history from.

On the other hand, the anorexia nervosa patients of group 4 talked freely about sex and actively sought out sexual material. Also, they looked habitually at themselves in a mirror and exhibited their bodies to others. Throughout their illness, they maintained their sexual activities. Binge-eating, vomiting and purging were prominent in this group, so that weight loss was irregular. Also, these women seldom reached very low weights.

Another study (Garfinkel et al., 1980) also showed that bulimic anorexics in Canada tended to have more heterosexual experience than dieting anorexics. According to these findings, increasing sexual activity appeared to be associated with a less severe weight loss, use of purgation and vomiting and an increasing exhibition of their bodies to others. However, since no one type of psychosexual history is common to all anorexics, it seems that only for some anorexia nervosa patients various sexual factors have a specific role in the aetiology of the illness.

On the basis of their clinical experience, Buvat-Herbaut (1983) got the impression that specific problems related to sexuality has been important for no more than 22% of anorexics. They also examined the attitudes toward sexuality of eighty-one French anorexics (age: 14 to 27 years). Of these, 80% had lost at least 25% of their previous weight. Fifty-four anorexics were in the emaciated stage, when they filled the questionnaire (ANE); and 27 women were gaining weight (AN-GW) at that time. The investigators found that the subjects of both anorexia nervosa groups feared sexuality more than the age-matched normal controls ($C = 20.6\%$, $ANE = 33\%$, $p < 0.01$; $AN-GW = 28\%$, n.s.). The proportion of the girls in the AN-GW-group who felt disgusted by sexuality, was higher than that of the

emaciated anorexics and of the controls ($C = 14\%$, $ANE = 18\%$, n.s.; $AN-GW = 37.5\%$, $p < 0.01$). The fact that anorexics gaining weight reported more disgust toward sexuality suggests that weight loss could have been used as a protection toward sexuality or sexual relationships. This study confirms that at least in some women sexual problems have been of importance for the onset and maintenance of anorexia nervosa.

6.4. Summary and discussion of attitudes toward menstruation, pregnancy and sexuality

Findings from questionnaires show that anorexics have distorted attitudes toward menstruation, pregnancy and sexuality. The anorexics expressed their fear of the change of the body shape and size during pregnancy. Menstruation was experienced as messy and dirty. Another focal point of the adolescents' pubertal crisis were sexual events. Although the adolescents are physically mature enough to enter a sexual relationship, they are often not able to because of their psychological development. But the pressure of peer groups is often, unfortunately, so strong that the adolescent girl does enter a sexual relationship without really appreciating it. When adolescents are not able to meet sexually related demands, it is likely that they wish to retreat from maturity. They may try to compensate for this inability with success in weight control: the physical changes seem to melt their conflicts away.

However, problems related to menstruation, pregnancy and sexuality do not appear to be cardinal features in all anorexics. Also, it is difficult to collect information referring to these body functions. Many people avoid discussions relating to sexual matters. Ultimately, one depends on what the patient is telling the interviewer. Therefore the reliability of the data must be considered limited. Finally, research

done to examine attitudes toward menstruation, pregnancy and sexuality is limited for both anorexics and healthy women. Therefore, it is difficult to decide to what extent anorexia nervosa patients are different from healthy women. However, it is doubtful, whether further studies examining anorexic and healthy populations in regard to their attitudes toward body functions are necessary to improve diagnosis and treatment of body image disturbance.

7. Discussion

The previously reviewed research data have confirmed the clinical experiences of physicians and psychologists: body image disturbance is a cardinal feature in anorexia nervosa. The body perception indices represent a bodily experience which is essential and of great importance for anorexia nervosa patients. Therefore, the assessment of body image disturbance is a helpful tool for the diagnosis of this disorder.

However, it remains controversial as to whether the assessment of the perceptual disorder provides some indication of the prognosis. While some studies indicated a tendency for a decrease in body image distortion accompanying an increase in weight, other research data did not confirm this tendency at all. Unfortunately, only one investigator (Garfinkel et al., 1978, 1979) examined the stability of visual self-perception in anorexics. He found that in spite of satisfactory weight gain the body image disturbance persisted. In addition, follow-up studies, which are very rare, mainly examined if the anorexics maintained their weight after discharge from hospital. It seems that the assessment of body image disturbances is appreciated only as a tool for the diagnosis. Once the patient has gained weight to the satisfaction of the medical staff, the overall interest in the anorexic's self-perception decreases. However, weight-gain *per se* is no indication of a healing process. If the patient's realistic and healthy self-perception and trust into her body cannot be reestablished, she is bound to relapse after discharge from hospital.

Body weight is only one facet of the anorexics' problem. The anxiety, fear and/or disgust of some anorexics in regard to menstruation and sexuality may also indicate their estrangement from their bodies. They do not experience their bodies as a source of pleasure and joy, but more

as a foreign object that they have to control. Therefore, it is of fundamental importance to employ "body therapy" during the treatment together with other approaches during the treatment and after discharge from hospital. Surprisingly, only one study implemented this therapy in order to enhance body awareness in anorexics (Brinkmann et al., 1981).

Another area of concern is that the empirical study of body image disturbance in anorexia nervosa patients has followed a single methodology: the question of a difference between anorexics and control females in the accuracy of estimating their body sizes was examined. There are no investigations studying how anorexics and controls perceive each other's bodies. Contrary to expectation, size estimation was not found to be a distinguishing variable as both groups exhibited overestimation tendencies. Although overestimation might be due to the methodological approaches or to poor estimation skills in general, it seems more likely that this phenomenon is a reflection of our society's obsession--food and bodies. Slimness and figure are highly valued, whereas obesity is fairly prominent. Dieting and concern about being overweight are commonplace. 'Anti-fat attitudes' are a source of anxiety and self-doubt for everyone who fears to become overweight. Body image disturbances of various degrees are bound to arise, especially in women. Men have been less subject to social pressures to be slim. This contributes to the fact that anorexia nervosa is less prevalent in males. Considering the overestimation tendencies in obese people as well, it seems likely that body image disturbance may be more the norm than the exception. In addition, social pressure seems to enhance body estrangement in several people. The human being experiences and responds to the world by his/her body. But it appears that few people are in touch with their own body--that is to be aware of its state of openness, and of

its tension pattern. When people do not listen to their bodies, they are likely to be off balance soon: they misperceive their bodily needs and employ extreme forms of weight control. 'Non-scientific' evidence of body estrangement in the 'normal' population is not poor. For instance, actors frequently demonstrate that they treat their bodies more or less like an object. According to their roles, they put on weight up to 20 kg or starve themselves so that their weight is far below ideal weight (People Magazine, 11-21-83, see Appendix D).

However, there are not enough data about body image perception of the 'normal' population available in order to make satisfactory comparisons with the anorexic population. Also, the origin and fundamental roles of anorexia nervosa as a perceptual disorder are still unknown. This underlines the great need of further studies in different populations with regard to age, sex, socio-economic status, family history and also geographical-cultural background.

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Appendix A

Feighner Criteria for Anorexia Nervosa¹

- 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 toward 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 disorders, schizophrenia, and 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) lanugo, (3) bradycardia (persistent resting pulse of 60 or less), (4) periods of overactivity, (5) episodes of bulimia, or (6) vomiting (may be self-induced).

¹For a diagnosis of anorexia nervosa, A through E are required (Halmi, 1983).

Appendix B

DSM-III Diagnostic Criteria for Anorexia Nervosa

The following material is a reprint of the diagnostic criteria for anorexia nervosa from the *Diagnostic and Statistical Manual of Mental Disorders*, Third Edition (DSM-III), published in 1980 by the American Psychiatric Association, Washington, D.C.

307.10 Anorexia Nervosa

The essential features are intense fear of becoming obese, disturbance of body image, significant weight loss, refusal to maintain a minimal body weight, and amenorrhea (in females). The disturbance cannot be accounted for by a known physical disorder. (The term "anorexia" is a misnomer, since loss of appetite is usually rare until late in the illness.)

Individuals with this disorder say they "feel fat" when they are of normal weight or even emaciated. They are preoccupied with their body size and often gaze at themselves in a mirror. At least 25% of their original body weight is lost, and a minimal normal weight for age and height is not maintained.

The weight loss is usually accomplished by a reduction in total food intake, with a disproportionate decrease in high carbohydrate- and fat-containing foods, self-induced vomiting, use of laxatives or diuretics, and extensive exercising.

The individual usually comes to medical attention when weight loss becomes significant. When it becomes profound, physical signs such as hypothermia, dependent edema, bradycardia, hypotension, lanugo (neonatal-like hair), and a variety of metabolic changes occur. Amenorrhea often appears before noticeable weight loss has occurred.

Associated features. Some individuals with this disorder cannot exert continuous control over their intended voluntary restriction of food intake and have bulimic episodes (eating binges), often followed by vomiting. Other peculiar behavior concerning food is common. For example, individuals with this disorder often prepare elaborate meals for others, but tend to limit themselves to a narrow selection of low-calorie foods. In addition, food may be hoarded, concealed, crumbled, or thrown away.

Most individuals with this disorder steadfastly deny the illness and are uninterested in, even resistant to, therapy. Many of the adolescents have delayed psychosexual development, and adults have a markedly decreased interest in sex. Compulsive behavior, such as hand-washing, may be present during the illness. A higher than expected frequency of urogenital abnormalities and Turner's syndrome has been found in individuals with Anorexia Nervosa.

Age at onset. Age at onset is usually early to late adolescence, although it can range from prepuberty to the early 30s (rare).

Sex ratio and prevalence. This disorder occurs predominantly in females (95%). As many as 1 in 250 females between 12 and 18 years (high-risk age group) may develop the disorder.

Course. The course may be unremitting until death by starvation, episodic, or, most commonly, a single episode with full recovery.

Impairment. The severe weight loss often necessitates hospitalization to prevent death by starvation.

Complications. Follow-up studies indicate mortality rates between 15% and 21%.

Familial pattern. The disorder is more common among sisters and mothers of individuals with the disorder than in the general population.

Predisposing factors. In some individuals the onset of illness is associated with a stressful life situation. Many of these individuals are described as having been overly perfectionist "model children." About one-third of the individuals are mildly overweight before the onset of the illness.

Differential diagnosis. In *Depressive Disorders*, and *certain physical disorders*, weight loss can occur, but there is no intense fear of obesity or disturbance of body image.

In *Schizophrenia* there may be bizarre eating patterns; however, the full syndrome of Anorexia Nervosa is rarely present; when it is, both diagnoses should be given.

In *Bulimia*, weight loss, if it does occur, is never as great as 25% of original body weight. In rare instances an episode of Anorexia Nervosa occurs in an individual with Bulimia, in which case both diagnoses are given.

Diagnostic criteria for Anorexia Nervosa

- 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 (pages 67-69).

DSM-III Diagnostic Criteria for Bulimia

The following material is a reprint of the diagnostic criteria for bulimia from the *Diagnostic and Statistical Manual of Mental Disorders*, Third Edition (DSM-III), published in 1980 by the American Psychiatric Association, Washington, D.C..

307.51 Bulimia

The essential features are episodic binge eating accompanied by an awareness that the eating pattern is abnormal, fear of not being able to stop eating voluntarily, and depressed mood and self-deprecating thoughts following the eating binges. The bulimic episodes are not due to Anorexia Nervosa or any known physical disorder.

Eating binges may be planned. The food consumed during a binge often has a high caloric content, a sweet taste, and a texture that facilitates rapid eating. The food is usually eaten as inconspicuously as possible, or secretly. The food is usually gobbled down quite rapidly, with little chewing. Once eating has begun, additional food may be sought to continue the binge, and often there is a feeling of loss of control or inability to stop eating. A binge is usually terminated by abdominal pain, sleep, social interruption, or induced vomiting. Vomiting decreases the physical pain of abdominal distention, allowing either continued eating or termination of the binge, and often reduces post-binge anguish. Although eating binges may be pleasurable, disparaging self-criticism and a depressed mood follow.

Individuals with Bulimia usually exhibit great concern about their weight and make repeated attempts to control it by dieting, vomiting, or the use of cathartics or diuretics. Frequent weight fluctuations due to alternating binges and fasts are common. Often these individuals feel that their life is dominated by conflicts about eating.

Associated features. Although most individuals with Bulimia are within a normal weight range, some may be slightly underweight and others may be overweight. Some individuals are subject to intermittent Substance Abuse, most frequently

of barbiturates, amphetamines, or alcohol. Individuals may manifest undue concern with body image and appearance, often related to sexual attractiveness, with a focus on how others will see and react to them.

Age at onset. The disorder usually begins in adolescence or early adult life.

Sex ratio. The disorder occurs predominantly in females.

Course. The usual course is chronic and intermittent over a period of many years. Usually the binges alternate with periods of normal eating, or with periods of normal eating and fasts. In extreme cases, however, there may be alternate binges and fasts with no periods of normal eating.

Familial pattern. No information, although frequently obesity is present in parents or siblings.

Impairment and complications. Bulimia is seldom incapacitating except in a few individuals who spend their entire day in binge eating and self-induced vomiting. Electrolyte imbalance and dehydration can occur in those below normal weight who vomit after binges.

Prevalence and predisposing factors. No information.

Differential diagnosis. In *Anorexia Nervosa* there is severe weight loss, but in Bulimia the weight fluctuations are never so extreme as to be life-threatening. In *Schizophrenia* there may be unusual eating behavior, but the full syndrome of Bulimia is rarely present; when it is, both diagnoses should be given. In certain neurological diseases, such as epileptic equivalent seizures, CNS tumors, Kluver-Bucy-like syndromes, there are abnormal eating patterns, but the diagnosis Bulimia is rarely warranted; when it is, both diagnoses should be given.

Diagnostic criteria for Bulimia

- 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 ten 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 disorder (pages 69-71).

Appendix C

Body Distortion Questionnaire

This section includes the Body Distortion Questionnaire form and instructions for scoring it.

Questionnaire

Read each of the statements below. If your answer to a statement is Yes, put an X under Yes. If your answer is No, put an X under No. If you are not sure whether to say Yes or No, put an X under Undecided.

	Yes	No	Undecided
1. My body feels unusually heavy.			
2. My body feels small.			
3. I feel like I should wash my hands.			
4. My mouth feels like it is changing in size.			
5. My body feels numb.			
6. I feel as if my skin is sore.			
7. My eyes feel like they are covered by a film.			
8. Things seem unusually close to my body.			
9. I feel as if parts of my body have disappeared.			
10. My nose feels blocked up.			
11. My hands feel small.			
12. Parts of my body feel swollen.			

	Yes	No	Undecided
13. My armpits feel unclean.			
14. My hands feel like they are changing in size.			
15. My rectum feels unusual.			
16. My skin itches less than usual.			
17. I feel like hiding my body.			
18. My hands feel like they are not mine.			
19. My throat feels blocked up.			
20. My head feels small.			
21. My neck feels unusually large.			
22. My skin feels unclean.			
23. My head feels like it is changing in size.			
24. My genital organs feel unusual.			
25. The right side of my body seems different from the left.			
26. My skin itches more than usual.			
27. I feel like my body is unprotected.			
28. My stomach feels blocked up.			
29. My chin feels small.			
30. My hips feel big.			
31. I feel like I have a dirty taste in my mouth.			
32. My body feels like it is changing in size.			
33. The sex of my body seems different.			
34. My skin feels less ticklish than usual.			
35. I feel that germs can somehow more easily get into my body.			

	Yes	No	Undecided
59. My kidneys feel blocked up.			
60. My mouth feels unusually small.			
61. My feet feel unusually large.			
62. I feel like I want to cover my body with something that will protect me.			
63. My skin feels looser than usual.			
64. My body feels like a non-living object.			
65. My nose feels big.			
66. My body feels like it is "stuffed" or too full.			
67. My feet feel unusually small.			
68. My ears feel unusually large.			
69. My skin feels tighter than usual.			
70. My body feels big.			
71. I feel less able to tell where my body ends and the outer world begins.			
72. I feel distant from my own body.			
73. My body feels blocked up.			
74. My ears feel unusually small.			
75. My mouth feels unusually large.			
76. My body feels too "open."			
77. I seem less aware of my body.			
78. My hands feel big.			
79. My body feels unusually light.			
80. My chin feels large.			
81. My neck feels unusually small.			

	Yes	No	Undecided
36. My body is less sensitive than it usually is.			
37. My ears feel stopped up.			
38. My nose feels small.			
39. My legs feel long.			
40. My hands don't feel as alive as usual.			
41. My skin is more ticklish than usual.			
42. I feel like my skin is too thin.			
43. My body feels "dead."			
44. My intestines feel blocked up.			
45. My hips feel small.			
46. My arms feel long.			
47. My toes feel dirty.			
48. My skin is warmer than it should be.			
49. My arms feel short.			
50. I feel like the inside of my body has no protection from things that happen near me.			
51. My body feels strange.			
52. My lungs feel stopped up.			
53. My eyes feel unusually large.			
54. The odor of my breath does not seem pleasant.			
55. My skin is colder than it should be.			
56. My eyes feel unusually small.			
57. Parts of my body feel as if they might become detached from me.			
58. My body feels like it is not mine.			

SCORING INSTRUCTIONS FOR BODY DISTORTION QUESTIONNAIRE

Procedure:

- (1) Draw a line under numbers when answer is "yes."
- (2) Encircle the numbers when answer is "undecided."

Total Yes

Total Undecided

Total Yes plus

Undecided Responses

(Total Distortion Score)

	Items:	Yes	Undecided	%
Larger	1, 12, 21, 30, 39, 46, 53, 61, 65, 68, 70, 75, 78, 80			
Smaller	2, 11, 20, 29, 38, 45, 49, 56, 60, 67, 74, 79, 81, 82			
Boundary	8, 9, 17, 27, 35, 50, 57, 62, 71, 76			
Blocked	7, 10, 19, 20, 37, 44, 52,			
Openings	59, 66, 73			
Skin	6, 16, 26, 34, 41, 42, 48, 55, 63, 69			
Dirt	3, 13, 22, 31, 47, 54			
Deperson- alization	5, 18, 36, 40, 43, 51, 58, 64, 72, 77			

(To compute "a" for each category, divide total "yes" plus "undecided" for each category by the overall total "yes" plus "undecided" for all categories.)

Appendix D

Acting demands its pound of flesh—and often more

Marlon Brando wore a padded mouth in *The Godfather*. Cicely Tyson used make-up to age 91 years in *The Autobiography of Miss Jane Pittman*. And Dustin Hoffman had to shave his legs and wear a corset to play a woman in *Tootsie*. But cosmetics aren't enough for some other actors, who have sculpted their bodies as well as their psyches for a part.

Christopher Reeve had to build 20 pounds of muscle to become Superman, working out for six months and foregoing any 2 a.m. carousing. After adding two inches each to his chest and biceps, he couldn't fit into his mild-measurement Clark Kent costumes.



Robert De Niro had to do for a job what others do for free: pig out. For *Raging Bull*, he gained 60 pounds in four months with French food, ice cream and beer. With the added flab, he got a rash from his thighs rubbing together. He lost the weight in four months, but that last 10 pounds was the hardest.



Michael Caine feasted on spaghetti and starches, gaining 35 pounds in four weeks to play the paunchy prof in *Educating Rita*. "It seemed to take 10 minutes," he enthused. He had six weeks to lose most of the weight for *Love, Rio*. "It was murderous," he moaned.



Meryl Streep reduced her fluid intake to lose 10 pounds for her role as a concentration camp victim in *Sophie's Choice*. The 5'8" actress also used makeup for her emaciated look.



Tom Cruise became the crazed cadet in *Taps* (above) by shaving his head, pumping iron and gorging for "a thick look, but not overweight." For *The Outsiders*, he took the cap off a front tooth for toughness. Then he shifted to become the soft Joel of *Risky Business*, taking vitamins and dieting to lose muscles, then eating "to put on a suburban cheeky, pinchy look." Back to Mr. Muscle, he went for *All the Right Moves*, working out again. "I'm pretty attuned to the body," he says.



Ben Kingsley as Gandhi took his loss of 20 pounds seriously. He shed them with "an absurdly controlled diet" that Gandhi followed, eating mostly vegetables. He shaved his head and sat in the sun for hours to turn his skin darker.

BODY IMAGE DISTURBANCE IN ANOREXIA NERVOSA

by

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AN ABSTRACT OF A MASTER'S REPORT

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Abstract

Anorexia nervosa is an eating disorder characterized by the relentless pursuit of a thin body size. It affects mainly adolescent girls and young women, but cases are seen in older women and also males.

Since the effects of severe self-starvation may cause death, anorexia nervosa is of major medical concern. Body image disturbances, interoceptive disturbances and a sense of ineffectiveness are cardinal features in this disorder. The available research data indicate that anorexics overestimate their body sizes to a greater extent than controls. The assessment of body image disturbance appears to be a tool for diagnosis and also an evaluation parameter of the treatment.

This report reviews objective and subjective methods of measuring body image disturbances. Investigations and general research problems are also discussed. In addition, distorted attitudes toward menstruation, pregnancy and sexuality in anorexics are reviewed.

Based upon this review of the literature, assessment of body image disturbances is a helpful tool for the diagnosis of anorexia nervosa. Whether the assessment provides some indication of the prognosis of this disorder, remains controversial.