

**The Nature and Significance of
Body Image Disturbance**

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All the studies in this thesis were designed, analysed, interpreted and written by me. I have attempted to give due reference to ideas that are not my own. Some data were collected with the help of others under my supervision, as indicated in the acknowledgements. This dissertation is not substantially the same as any that I have submitted for a degree or diploma or other qualification at any other university.

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Abstract

A disturbance in body image is generally recognised as central to the eating disorders. Although misperception of body size has been examined extensively in anorexia nervosa, there has been no satisfactory study of a disturbance in body size perception in relation to the eating disorder bulimia nervosa. In addition, concern about body shape, which also constitutes an important aspect of body image disturbance, has received little systematic research attention, probably because there has been no satisfactory measure of this concern. A series of studies was conducted which aimed to overcome the problems and limitations associated with the research on body image. The significance of body image disturbance was investigated among patients with bulimia nervosa; and similar disturbances among women in the community were evaluated.

A measure of concern with shape, the *Body Shape Questionnaire*, was developed and validated. The responses of a large series of patients with bulimia nervosa were obtained, and the relationship between concern with shape and other clinical variables was investigated. A particularly high level of such concern in these patients was found to be associated with markedly disturbed eating behaviour and a high level of general psychological disturbance, most notably depressed mood and self-deprecation. Body size perception in bulimia nervosa was also investigated. Using an image distortion method, the patients were found to overestimate their size significantly more than a control group, and were markedly more dissatisfied with their body size. Similar to concern with shape, disturbances in body size perception were found to be associated with disturbed eating behaviour and a high level of psychological disturbance. Among a subsample of patients who received treatment, both aspects of body image disturbance were found to improve; and changes in body image were closely related to improvements in eating habits and attitudes and were accompanied by a concurrent improvement in mood.

Some women in the community were found to show disturbances in body image similar to those found in the patients with bulimia nervosa. A series of studies was conducted to identify factors related to these disturbances. A high level of concern with shape was found to emerge at a young age, and was associated with a number of factors which have also been established as significant in patients with eating disorders; notably disturbed eating habits and attitudes and depressed mood. For the subgroup of women in whom concern with shape was found to be labile, changes in these concerns were found to co-vary with mood. As in patients with eating disorders, among women in the community a disturbance in body size perception was found to be closely related to depressed mood and concern with shape; and some evidence was found to support the hypothesis that depressed mood may exacerbate disturbances in body size perception, particularly in the context of a high level of concern with shape.

The series of studies has demonstrated that patients with bulimia nervosa show a disturbance in body image; that such disturbance is meaningfully related to other features of the eating disorder; and that similar features also predict such disturbance among women in the community with no syndromal eating disorder. In these studies of body image disturbance in patients with bulimia nervosa, patients with anorexia nervosa and women in the community, a consistent finding was that depressed mood was strongly predictive of such disturbance. The research has implications for the understanding of the psychopathology of eating disorders and possibly for the treatment of body image disturbance as it arises in these conditions.

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Abbreviations

BDI - Beck Depression Inventory
BMI - Body mass index
BSQ - Body Shape Questionnaire
EAT - Eating Attitudes Test
EDE - Eating Disorder Examination
EDI - Eating Disorder Inventory
GSI - *Global Severity Index* of the SCL-90
IDM - Image distortion method
IMM - Image marking method
MCT - Moveable calliper technique
MIP - Mood induction procedure
MPMW - Mean population matched weight
OT - Occupational therapy
SCL-90 - Symptom Checklist-90
SPM - Serial pictures method

Chapter 1

General Introduction

Section 1: Introduction

In recent years a disturbance in body image has been discussed frequently in relation to the eating disorders anorexia nervosa and bulimia nervosa. This is principally because concerns with body size and shape are striking features of these disorders. Indeed, it has been suggested that such concerns are of cardinal importance to the disorders. Nevertheless, similar concerns are also found among many women in the community.

The concept of body image may be considered to encompass two main aspects: perception of body size and concern with body shape. It is essential to distinguish between these two aspects because they are not synonymous or even necessarily related. A disturbance in body image may manifest in incorrectly assessing body size or in marked concern with body shape. A person may incorrectly assess their body size but be untroubled by this. Conversely, a person may correctly assess their body size but experience intense disparaging feelings towards their body shape. Researchers in the field of body image have not always drawn the distinction between perception of body size and concern with body shape. In order to evaluate the nature and significance of a disturbance in body image in anorexia nervosa and bulimia nervosa, it is first necessary to describe these disorders briefly.

Anorexia Nervosa

Anorexia nervosa is predominantly found among adolescent females. It is characterised by extreme self-induced weight loss to the point of emaciation with no known physical cause, together with morbid concerns about shape and weight. Many symptoms accompany the weight loss, including severe dietary restraint, unusual eating patterns (eg. monotonous and ritualised), amenorrhoea and hyperactivity. Depressed mood is a common feature.

The importance of body image in anorexia nervosa was perhaps first recognised by Hilde Bruch (1962). She reported that these patients show *a disturbance in body image of delusional proportions*, that this disturbance is *pathognomic* to the disorder, being more important than weight loss, and that *a realistic body image is a precondition for recovery from the disorder* (Bruch, 1962, 1973). Many patients with anorexia nervosa report that they *feel fat* or claim that they *are fat*; and all show an intense fear of becoming fat and pursue a markedly thin body shape. Such concerns with shape are more extreme than those shown by normal young women, and are included in the major formal diagnostic criteria for anorexia nervosa, as shown in Table 1.1. (Full criteria are given in Appendix 1.)

Table 1.1
Concerns with body shape necessary for a diagnosis of
Anorexia nervosa

“....a morbid fear of becoming fat....”

(Russell,1970)

“....a desired body image of extreme thinness....”

(Feighner et al,1972)

“....intense fear of becoming obese, which does not diminish as weight loss progresses....Disturbance of body image, eg., claiming to ‘feel fat’ even when emaciated.”

(DSM III; American Psychiatric Association,1980)

Bulimic disorders

In contrast with anorexia nervosa which was first described in the seventeenth century, bulimic disorders have been recognised only over the past decade. Many terms have been used to describe these disorders, but the two which have gained widest acceptance are *bulimia nervosa* (Russell,1979) which is principally the British term, and *bulimia* (DSM III, American Psychiatric Association,1980) which is principally the American term. The syndromes bulimia nervosa and bulimia are characterised by discrete episodes of overeating, usually called *binges*, which are experienced by the sufferer as being beyond voluntary control. Binges typically occur in secret, are distressing and evoke intense feelings of guilt and self-disgust (Fairburn et al,1986a). The majority of sufferers are of normal weight because they compensate for the fattening effects of overeating by inducing vomiting, abusing laxatives, vigorous exercising or strict dieting. Almost all who suffer from bulimia nervosa or bulimia are female.

The symptoms necessary for diagnosing bulimia nervosa and bulimia are slightly different. Russell (1979) included *a morbid fear of becoming fat* as a necessary feature of bulimia nervosa, but this is not essential for a diagnosis of bulimia. All patients with bulimia nervosa satisfy criteria for bulimia, whereas the converse is not true (Fairburn and Cooper,1984a). The full diagnostic criteria for the syndromes are given in Appendix 2.

Three questions

There are many similarities between anorexia nervosa and bulimia nervosa. Some patients with anorexia nervosa experience the bulimic episodes which define bulimia nervosa, and depressed mood is a common feature of both disorders. Both anorexia nervosa and bulimia nervosa are characterised by a marked fear of fatness and an extreme importance placed on achieving and maintaining a slim body shape. The distinction between concerns with body size and shape raises three main questions:

- (1) Do patients with eating disorders inaccurately perceive their body size?
- (2) If patients with eating disorders inaccurately perceive their body size and experience extreme concern with their body shape, do such disturbances distinguish these patients from women in the general population?
- (3) Are disturbances in body size perception and concern with shape clinically significant, in terms of their relationship with other symptoms, response to treatment, and outcome from the disorders?

The relevant research literature will be reviewed in an attempt to answer these questions.

Section 2: Perception of body size

Various methods have been used to measure perception of body size. Some of these techniques have been reported to be methodologically unsound (eg. Swenson, 1968) and will not be discussed. The four most commonly used methods are the moveable calliper technique, the image marking method, the image distortion method, and the serial pictures method. Although the specific apparatus has varied between studies, the basic principles of each technique have remained the same.

The moveable calliper technique

The apparatus for the moveable calliper technique basically consists of two moveable reference points, such as small points of light or markers. The subject adjusts the distance between the markers to correspond with the width of various areas of her body, such as the waist and hips. She makes her estimations either by controlling the markers herself, or by directing the experimenter to adjust them. The actual width of the subject is then measured, and estimated width is expressed as a percentage of actual width, where 100 percent represents correct estimation, percentages less than 100 represent underestimation, and percentages greater than 100 represent overestimation.

The image marking method

Using the image marking method, a subject estimates her body size by marking a piece of paper fixed to a wall. She stands facing the paper, imagines that she is looking at her reflection, and marks the paper according to how large she thinks various areas of her body are. Again, estimated width is expressed as a percentage of actual width.

The image distortion method

The image distortion method involves projecting an image of the subject onto a screen, usually a television monitor, a camera projector screen or a mirror. An optical or electrical device varies the width of the image, and the subject adjusts a distorted image to the size she thinks she is. Again, estimations are expressed as a percentage of correct size.

The serial pictures method

Using the serial pictures method, a subject views a series of human figure drawings which range from very thin to very fat, and selects the picture which she thinks most closely resembles her own body size. A major problem with this method is that it is not possible to determine which picture is *correct* since the pictures are not of the subject's own body. It is therefore not possible to say whether the subject is accurate at estimating her body size. Nevertheless, selecting from a series of pictures is useful for studying desired size, and dissatisfaction with body size in terms of the discrepancy between perceived and desired size.

Disturbances in body size perception

To determine whether patients with eating disorders show disturbances in body size perception it is necessary to compare their estimations with those of normal women. If patients alone were studied with no control population and it were found that they overestimated their size, this may be because *all* women show a similar tendency, perhaps due to the specific conditions of the testing situation. If this were the case then overestimation could not be considered to represent a disturbance in body size perception.

Perception of body size in anorexia nervosa

Clinical reports suggest that at least some patients with anorexia nervosa may misperceive their body size, as is illustrated by a severely underweight patient reported by Garfinkel and Garner (1982a) who is quoted to have said:

I look in a full length mirror at least four or five times daily and I really cannot see myself as too thin. Sometimes after several days of strict dieting, I feel that my shape is tolerable, but most of the time, odd as it may seem, I look in the mirror and believe that I am too fat.

In recent years there has been considerable research into body size perception in patients with anorexia nervosa to determine whether these patients recognise their emaciated state.

The moveable calliper technique

Slade and Russell (1973) were the first to assess systematically body size perception in patients with anorexia nervosa. In a seminal paper using the moveable calliper technique, they reported that these patients overestimated the width of certain areas of their body, whereas control subjects were accurate at estimating their own size. Since Slade and Russell's report many other studies have measured body size perception in anorexia nervosa, and findings have been less clear. Using the moveable calliper technique, all studies found that patients with anorexia nervosa overestimated their body size. Only 11 studies included a control group; and of the 11 case

controlled studies,¹ only six found that patients with anorexia nervosa overestimated their size significantly more than controls. Findings are summarized in Table 1.2. In the studies which presented estimations for individual body parts the means of these are presented.²

Table 1.2
Body size overestimation in patients with anorexia nervosa using
The moveable calliper technique

	Patients \bar{X}	Controls \bar{X}	P
Slade and Russell (1973)	135.9	97.3	*
Crisp and Kalucy (1974)	Insufficient data		NS ¹
Garner et al (1976)	Insufficient data		NS
Button et al (1977)	112.3	114.1	NS
Fries (1977)	136	109	***
Pierloot and Houeben (1978)	123.7	104.6	***
Casper et al (1979)	114.0	110.1	NS
Ben-Tovim et al (1984)	Insufficient data		NS
Norris (1984)	118.0	101.5	*** ²
Fichter et al (1986)	Insufficient data		*
Proctor and Morley (1986)	142.1	110.8	*** ³

* $P < .05$; *** $P < .001$

1 Not significant

2 Although the author reported no significant difference between the estimations of patients with anorexia nervosa and controls, using Student's t-test the difference between these two groups is highly significant (Anorexia nervosa $\bar{X}=118.0$, $sd=11.5$, $N=12$ versus controls $\bar{X}=101.5$, $sd=7.3$, $N=12$; $t=4.01$, $df=22$, $P < .001$).

3 This study reports different estimations using several sets of instructions. The results reported here refer to estimations using *ambiguous instructions*, which the authors believed were most similar to the instructions used in other studies.

The image marking method

Six studies have used the image marking method to compare estimations of body size of patients with anorexia nervosa with those of controls. All found that patients with anorexia nervosa overestimated their body size. However, similar to the moveable calliper technique, only three studies found that overestimation in these patients was significantly greater than that shown

¹ One other study (Thompson et al, 1986) compared the estimations of normal women with the estimations of women with eating disorders, some of whom appeared to be suffering from anorexia nervosa. However, the authors did not use conventional diagnostic criteria, making it difficult to interpret the results from this study.

² Since all studies measured estimations of chest, waist and hip size, the mean of these three body parts is given.

by normal young women. Findings are summarized in Table 1.3. As above, in the studies which presented estimations for individual body parts the mean of these is presented.

Table 1.3
Body size overestimation in anorexia nervosa
Using the image marking method

	Patients \bar{X}	Controls \bar{X}	P
Wingate and Christie (1978)	120.0	93.8	*
Pierloot and Houben (1978)	124.9	108.9	*
Strober et al (1979)	121.5	115.3	NS ¹
Meerman (1983)	117.2	111.3	NS
Whitehouse (1985)	112.0	102.2	NS
Fichter et al (1986)	Insufficient data		*

* $P < .05$;

¹ Not significant

The image distortion method

Thirteen studies used the image distortion method to measure body size perception among patients with anorexia, as shown in Table 1.4. However, it is difficult to interpret the results from one study (Huon and Brown, 1986), since the authors used several sets of experimental instructions for each subject and presented figurative data only from individuals, omitting group means (although the authors reported that the estimations of patients and controls were similar). Of the remaining 12 studies, only eight included a control comparison group; but for two of the studies which omitted a control group, comparison data may be derived from other published studies by the same authors (Garner et al, 1976; Touyz et al, 1984; personal communication). Of the 10 case controlled studies, six found that patients slightly overestimated their body size; and five found that estimations were significantly larger than those of normal women who usually either underestimated or were accurate.

Table 1.4
Body size overestimation in anorexia nervosa using the
Image distortion method

	Patients	Controls	P
Garner et al (1976)	100.5	95.8	**
Garfinkel et al (1977)	No control group		
Garfinkel et al (1978)	103.9	100.6	* ¹
Strober (1981)	No control group		
Freeman et al (1983)	106.7	103.4	*
Meerman (1983)	94.2	85.2	*
Touyz et al (1984)	99.5	101.0	NS ²
Freeman et al (1985a)	106.4	102.9	NS
Garner et al (1985) ³	104.2	95.8	**
Touyz et al (1985) ⁴	105.5	101.0	NS
Whitehouse (1985)	100.7	96.1	NS
Fichter et al (1986)	Insufficient data		NS
Huon and Brown (1986)	Insufficient data		NS

* $P < .05$; ** $P < .01$;

¹ ($P < .06$)

² Not significant

³ Control group data from Garner et al (1976): personal communication

⁴ Control group data from Touyz et al (1984): personal communication

Thus, with all three methods of measuring body size overestimation, patients with anorexia nervosa have sometimes been found to overestimate their body size more than normal young women, but frequently no difference has been found. However, studies have reported considerable variability in estimations within samples of patients. Not all overestimate; and some normal women overestimate. Therefore, body size overestimation is not particularly useful for distinguishing patients with anorexia nervosa from normal young women, and is certainly not pathognomic of the disorder.

Factors associated with body size overestimation

Since some patients with anorexia nervosa have been found to markedly overestimate their body size while others are either accurate or underestimate, it is important to examine the clinical significance of overestimation. Studies have found that using all three methods of measurement, body size overestimation before treatment is generally associated with a number of factors indicative of a severe illness. In addition, and perhaps more important, body size overestimation has been found to predict a poor recovery from the disorder. Factors which have most commonly

been associated with overestimation among these patients are summarized in Tables 1.5, 1.6 and 1.7.

Table 1.5
Factors associated with body size overestimation using the
Moveable calliper technique

Relapse after discharge	Slade and Russell	(1973)
	Crisp and Kalucy	(1974)
	Button et al	(1977)
	Goldberg et al	(1977)
Very low body weight	Button et al	(1977)
	Goldberg et al	(1977)
	Ben-Tovim et al	(1979)
	Casper et al	(1979)
Poor weight gain during treatment	Casper et al	(1979)
Fewer outpatient appointments	Casper et al	(1979)
More previous hospitalisations	Casper et al	(1979)
Vomiting	Button et al	(1977)
Loss of appetite	Goldberg et al	(1977)
	Casper et al	(1979)
Denial of illness	Goldberg et al	(1977)
	Casper et al	(1979)
Hyperactivity	Goldberg et al	(1977)
Psychosexual immaturity	Goldberg et al	(1977)
	Casper et al	(1979)

Thus, among patients with anorexia nervosa, body size overestimation assessed using the moveable calliper technique has most commonly been associated with a very low body weight and a poor outcome from the disorder.

Table 1.6
Factors associated with body size overestimation using the
Image marking method

Vomiting	Strober et al	(1979)
Low ego strength	Wingate and Christie	(1978)

Thus, there has been very little empirical investigation into factors associated with body size overestimation using the image marking method among patients with anorexia nervosa and no firm conclusions may be drawn.

Table 1.7
Factors associated with body size overestimation using the
Image distortion method

Poor recovery	Garfinkel et al	(1977)
Very low body weight	Garfinkel and Garner	(1984)
More previous hospitalisations	Garfinkel et al	(1977)
Restrained eating	Garfinkel and Garner	(1984)
High EAT ¹ score	Garner and Garfinkel	(1981)
	Freeman et al	(1984)
Small desired size	Garner and Garfinkel	(1981)
Dissatisfaction with body shape	Garfinkel and Garner	(1984)
Depressed mood	Garner and Garfinkel	(1981)
	Strober	(1981)
Labile mood	Garfinkel and Garner	(1984)
Anhedonia	Garfinkel and Garner	(1984)
Anxiety	Garfinkel and Garner	(1984)
Low self-esteem	Garfinkel and Garner	(1984)
External locus of control	Garner et al	(1976)
Neuroticism	Garner et al	(1976)

1 Eating Attitudes Test (Garner and Garfinkel, 1979)

Thus, among patients with anorexia nervosa, body size overestimation using the image distortion method has been associated with factors suggesting a severe illness and a poor general psychological state.

Change during treatment

Despite the attention devoted to body size estimation in anorexia nervosa, comparatively few studies have examined change in estimations in relation to treatment for the disorder. One study (Slade and Russell, 1973) found that overestimation decreased with weight gain, but four studies (Crisp and Kalucy, 1974; Button et al, 1977; Garfinkel et al, 1979; Strober et al, 1979) reported that estimations were similar before and after weight gain. Thus, overestimation is a phenomenon which appears to persist.

Desired size and body size dissatisfaction

A cardinal feature of anorexia nervosa is a strong desire for thinness. Seven studies have examined the desired size of these patients using the image distortion method by asking them to adjust the image to the size they would like to be. Two of these studies (Freeman et al,1985a; Touyz et al,1984) found that the desired size of patients with anorexia nervosa was significantly smaller than their perceived size; and four studies (Garfinkel et al,1979; Garner et al,1976,1985; Touyz et al,1985) found that desired size was similar to perceived size. Again, there was considerable variability within samples of patients, with some wishing to be much smaller than their perceived size, and others wishing to be much larger.

Dissatisfaction with body size is arguably more important than estimation of body size *per se*, since a subject may accurately estimate her size but experience a strong desire to be thinner. Conversely, a subject may overestimate but be unconcerned with her size. The discrepancy between perceived and desired size is a useful index of dissatisfaction with body size. Although only one study (Freeman et al,1985a) explicitly reported body size dissatisfaction in patients with anorexia nervosa, dissatisfaction scores may be derived from two others (Garner et al,1985; Touyz et al,1985). It is not possible to conduct statistical analysis on these data but it is apparent from Table 1.8 that patients with anorexia nervosa are no more dissatisfied (and perhaps are more satisfied) with their size compared with normal women. In a recapitulation of Hilde Bruch's (1962) ideas about the importance of body image disturbance in anorexia nervosa, it could be argued that it is this satisfaction with an emaciated body which may be considered to be a pathognomic feature of the disorder, since no other patients derive pleasure from extreme thinness.

No study has reported relationships between desired size, dissatisfaction with size and other clinical features of anorexia nervosa.

Table 1.8
Body size dissatisfaction (perceived size minus desired size)
in anorexia nervosa

	Anorexia Nervosa Patients %	Controls %
Freeman et al (1985a)	6.2	8.5
Garner et al (1985) ¹	-0.6	5.68
Touyz et al (1985) ¹	10.5	21.11

1 Control groups derived from Garner et al (1976) and Touyz et al (1984): personal communication.

Summary

Although only some patients with anorexia nervosa overestimate their size more than normal young women, overestimation has been associated with factors indicating severe illness and predicts a poor recovery from the disorder. As a group, patients with anorexia nervosa appear to be more satisfied with their body size than normal young women, and this satisfaction with a thin body may represent a pathognomic feature of the disorder.

Perception of body size in bulimia and bulimia nervosa

There have been nine studies of body size perception in patients with bulimia or bulimia nervosa, as shown in Table 1.9. However, it is difficult to interpret the results from two of these studies. The report by Williamson et al (1985) was based on the serial pictures method, and using this method it is not possible to say whether an individual overestimates her size since none of the pictures are of her own body. The study by Huon and Brown (1986), as mentioned above, did not present group mean estimations (although the authors reported no significant difference between the estimations of patients and controls). Of the remaining seven studies, two included no control group of normal women (Garner et al, 1985; Touyz et al, 1985), but it is possible to extrapolate control data from other studies published by the same authors (Garner et al, 1976; Touyz et al, 1984: personal communication). Among the seven case controlled studies, all except one found that patients with bulimia nervosa or bulimia overestimated their body size significantly

more than normal young women.

Table 1.9
Perception of body size in patients with
bulimia or bulimia nervosa

	Method	Patients	Controls	P
Norris (1984)	MCT ¹	118.5	101.5	* ²
Freeman et al (1985a)	IDM ³	106.5	102.9	*
Garner et al (1985)	IDM	107.6	95.8	***
Touyz et al (1985)	IDM	111.3	101.0	*
Williamson et al (1985)	SPM ⁴	Insufficient data		*
Willmuth et al (1985)	MCT	115.7	103.7	**
Birtchnell et al (1985)	MCT	123.7	117.6	NS ⁵
Huon and Brown (1986)	IDM	Insufficient data		NS
Whitehouse et al (1986)	IMM ⁶	110.8	102.2	*
	IDM	103.1	96.1	**

* P<.05; ** P<.01; *** P<.001

1 Moveable calliper technique

2 Although the author reported no significant difference between patients with bulimia and controls, using Student's t-test the difference between these two groups is significant (Bulimia patients=118.5, sd=12.6, N=12 versus Controls=101.5, sd=7.3, N=12; t=3.87, df=22, P<.001).

3 Image distortion method

4 Serial pictures method

5 Not significant

6 Image marking method

Five studies measured body size perception in patients with bulimia or bulimia nervosa and also in patients with anorexia nervosa, as shown in Table 1.10.³ In one study patients with bulimia or bulimia nervosa overestimated their size significantly more than patients with anorexia nervosa; and in four studies there was no difference between the estimations of these two groups of patients. Findings are therefore equivocal but suggest no difference in estimations of body size between patients with anorexia nervosa and patients with bulimia.

³ The study by Whitehouse (1985) did not compare the estimations of patients with bulimia and anorexia nervosa, but it is possible to derive the data from this study.

Table 1.10
Body size estimation in patients with anorexia nervosa and bulimia

	Method	Anorexia Nervosa Patients	Bulimia Patients	P
Norris (1984)	MCT ¹	118.0	118.5	NS ²
Freeman et al (1985a)	IDM ³	106.4	106.5	NS
Garner et al (1985)	IDM	104.2	107.6	NS
Touyz et al (1985)	IDM	105.5	111.3	*
Whitehouse (1985)	IMM ⁴	112.0	110.8	NS
	IDM	100.7	103.1	NS

* P<.05

1 Moveable calliper technique

2 Not significant

3 Image distortion method

4 Image marking method

Although studies generally found that patients with bulimia nervosa or bulimia overestimated their size more than normal women and sometimes more than patients with anorexia nervosa, the extent of overestimation was not great. Indeed, the average overall difference across the studies between the estimations of patients and controls was smaller than the average range in estimations within samples of patients. Thus, although patients with bulimia or bulimia nervosa do overestimate their body size more than normal young women, this overestimation does not appear to represent a gross perceptual error, not all patients make this perceptual error, and some normal women do.

Since not all patients with bulimia or bulimia nervosa appear to overestimate their body size, it is relevant to assess the clinical significance of body size overestimation in terms of its association with other features of the disorder. There has been no systematic investigation into factors associated with body size overestimation among patients with bulimia or bulimia nervosa, but preliminary assessments made by some studies suggest that overestimation may be associated with demographic variables and clinical features of the disorder. Birtchnell et al (1985) found that overestimation was associated with a high body weight; Freeman et al (1983) found that overestimation was associated with a high score on the Eating Attitudes Test (Garner and Garfinkel, 1979) which measures disturbed eating attitudes and behaviour; and Whitehouse et al (1986) found that overestimation was associated with dissatisfaction with specific body parts. Only one study (Freeman et al, 1985a) has attempted systematically to identify a range of factors associated with overestimation, and the results from this study are difficult to interpret because

the authors used principal components analysis to examine factors related to body size perception "as a means of data reduction".

Thus, among patients with bulimia or bulimia nervosa the clinical significance of body size overestimation in terms of its association with other features of the disorder is not known.

Desired size and body size dissatisfaction

Although the clinical features of anorexia nervosa and bulimia nervosa are similar, it has been suggested that few patients with bulimia nervosa show the extreme desire for thinness which characterises anorexia nervosa (Fairburn and Cooper,1984a). Four studies have examined the desired size of patients with bulimia or bulimia nervosa. Three (Freeman et al,1985a; Garner et al,1985; Touyz et al,1985) used the image distortion method; and one (Williamson et al,1985) used the serial pictures method. All found that these patients wished to be significantly thinner than their perceived size.

However, as was shown in Table 1.8, it is usual for young women to wish to be thinner than their perceived size. It must therefore be established whether patients with bulimia nervosa or bulimia are more dissatisfied with their body size compared with normal women. Williamson et al (1985), using the serial pictures method, reported that these patients were six times more dissatisfied with their size compared with normal women. Only one other study reported body size dissatisfaction among these patients (Freeman et al,1985a), but data may be derived from two others (Garner et al,1985; Touyz et al,1985). Although there is insufficient information to conduct statistical analysis, Table 1.11 shows that in all three studies patients with bulimia were markedly more dissatisfied with their size compared with normal young women.

Table 1.11
Body size dissatisfaction (perceived size minus desired size) in
patients with bulimia

	Bulimia Patients	Controls
Freeman et al (1985a)	19.1	8.5
Garner et al (1985)	22.9	5.68
Touyz et al (1985)	29.4	21.1

There has been very little research into the relationship between body size dissatisfaction and other clinical features of bulimia. One study (Freeman et al,1983) reported that body size dissatisfaction was associated with depressed mood. Another study (Freeman et al,1985a) investigated the relationship between body size dissatisfaction and a range of other factors. However, as with these authors' report on body size overestimation, they used principal components analysis to identify related factors, thereby making it difficult to interpret factors associated with body size dissatisfaction. A further study by the same group (Freeman et al,1985b) reported that dissatisfaction with body size at the end of treatment predicted relapse six months later.

Thus, there has been some indication that patients with bulimia may be highly dissatisfied with their body size, and that such dissatisfaction may predict relapse from the eating disorder, but the general clinical significance of body size dissatisfaction among these patients is not known.

Summary

Young women suffering from bulimia or bulimia nervosa have usually been found to overestimate their size more than normal young women, and their estimations have been found to be similar to those of patients with anorexia nervosa. Patients with bulimia appear to be markedly more dissatisfied with their size than normal women. There has been little systematic investigation into the clinical significance of body size overestimation and body size dissatisfaction among these patients, but preliminary evidence suggests that marked dissatisfaction may be related to depressed mood and may predict a poor recovery from the disorder.

Section 3: Methodological considerations

Despite significant findings which have arisen from studies of body size perception, there have been many inconsistencies between studies. These may be at least partly due to methodological problems and procedural differences. In view of methodological limitations findings from many of the studies must be interpreted with caution.

Reliability

Reliability refers to whether a measure repeatedly produces the same results under the same testing conditions (Anastasi,1968). It is important because, if a measurement is not repeatable, its results cannot be interpreted. If subjects do not estimate their size similarly with repeated testing on the same apparatus in the absence of other changes, then it is illegitimate to regard estimations as meaningful.

The reliability of methods of measuring body size estimation has been assessed in two ways: i) by comparing estimations of the same body area made at different times; and ii) by comparing successive estimations of different body parts. Some variation in estimations is to be expected with both methods; first, because time may introduce meaningful changes which may not be readily obvious and which may affect estimations of body size; and second, because it does not

necessarily follow that if subjects overestimate the size of one body part they will equally overestimate the size of other body areas. Nevertheless, significant relationships between estimations made across time and between successive estimations of different body parts would suggest that a measure is reliable.

Using the moveable calliper technique, only one study has reported correlations between estimations made across time. Ben-Tovim et al (1984) found that for a small group of normal women, estimations repeated one hour and two weeks later were highly related to the initial estimation ($r=.88$ and $r=.87$ respectively). No study using the moveable calliper technique has reported reliability coefficients for patients with eating disorders; and no study has reported test re-test reliability coefficients using the image marking method. Using the image distortion method, three studies (Garfinkel et al, 1979; Freeman et al, 1984, 1985a) reported correlations between estimations of body size across time for patients with eating disorders and controls, and reliability coefficients ranged from .45 to .91 for estimations made up to two weeks apart. Thus, the moveable calliper technique has shown significant test re-test reliability for normal women, and the image distortion method has shown significant test re-test reliability for patients with eating disorders and normal women.

An alternative method of assessing the reliability of body size estimation would be to examine relationships between consecutive trials within the same testing session. This would indicate short term reliability, and would reduce the possibility of introducing changes in other factors which may affect estimations. Most studies included four trials for each estimation, ie. two trials from a wide stimulus and two from a narrow; but none reported the correlations between the two estimations made from a wide stimulus; or between the two estimations made from a narrow stimulus.

With studies which used the moveable calliper technique the average correlation between estimations of different body parts was .67 for patients with anorexia nervosa,⁴ and $r=.61$ for controls.⁵ Using the image marking method, the average correlation between different body parts for patients with anorexia nervosa was .52,⁶ and for control women $r=.57$.⁷ For the image distortion method, estimations of frontal and profile images of body size were significantly related for patients and controls, with coefficients ranging from .59 to .86.⁸ These findings imply that subjects who overestimate one area of their body also tend to overestimate other areas.

⁴ Studies which provided the data for this figure are: Slade and Russell (1973), Button et al (1977), and Pierloot and Houben (1978).

⁵ Studies which provided the data for this figure are: Slade and Russell (1973), Button et al (1977), Halmi et al (1977), and Pierloot and Houben (1978).

⁶ Studies which provided the data for this figure are: Pierloot and Houben (1978) and Strober et al (1979).

⁷ Studies which provided the data for this figure are Pierloot and Houben (1978) and Strober et al (1979).

⁸ Studies which provided the data for these figures are: Meerman (1983) and Freeman et al (1985a).

Summary

Since there is great variability in estimations of body size, it is important to assess the reliability of methods used to measure estimations. The moveable calliper technique and the image distortion method show a satisfactory degree of test re-test reliability for normal women; the image distortion method also shows a satisfactory degree of reliability for patients with eating disorders; but the reliability of the image marking method has not been established.

Validity

Validity refers to whether a measure assesses the phenomenon it is intended to measure (Anastasi, 1968). With body size estimation, different estimations between subjects may reflect how subjects respond to the specific conditions of the testing situation rather than errors at estimating their body size. One way of assessing the validity of a measure is to examine its relationship with similar measures. Although four studies of body size perception used more than one method of measuring estimations (Garner et al, 1976; Pierloot and Houben, 1978; Meerman, 1983; Whitehouse, 1985), only two studies reported the relationship between different methods. Garner et al (1976) found that estimations of body size using the moveable calliper technique were moderately related to estimations using the image distortion method for patients with anorexia nervosa ($r=.50$) and obese patients ($r=.44$), but they found no significant relationship between the two methods for normal women. Whitehouse (1985) found that estimations using the image marking method were significantly related to estimations using the image distortion method for patients with anorexia nervosa ($r=.72$), and for patients with bulimia ($r=.47$); but again found no significant relationship between the two measures for normal women ($r=-0.22$). Thus, different methods of measuring body size estimation have been found to be moderately related among patients with eating disorders but not among controls. These results provide some support for the concurrent validity of the moveable calliper technique, the image marking method and the image distortion method for patients with eating disorders but not for controls.

Another way of examining the validity of measures of body size estimation is to examine the relationships between these perceptual measures and conceptually related measures. Dissatisfaction with body shape measured by questionnaires has been found to be moderately related to body size overestimation using the image distortion method for patients with anorexia nervosa (Garfinkel and Garner, 1982a) and bulimia (Willmuth et al, 1985; Whitehouse et al, 1986). Dissatisfaction with body shape was found to be unrelated to body size overestimation using the moveable calliper technique for obese patients (Pearlson et al, 1981); and to body size overestimation using the image marking method for patients with anorexia nervosa, bulimia and controls (Whitehouse, 1985). These results provide some support for the concurrent validity of the image distortion method but not for the moveable calliper technique or the image marking method.

One advantage the image distortion method has over the moveable calliper technique and the image marking method is that it does not rely on a subject's memory of their body size for

imagining or visualising their image in order to estimate their size, which would appear to provide further support for the validity of this method.

Summary

Estimations using different methods of measuring body size perception have been found to be moderately related to each other among patients with eating disorders but not among normal women. Dissatisfaction with specific body parts has been associated with body size overestimation using the image distortion method but not with overestimation using the moveable calliper technique or the image marking method. These findings provide some support for the concurrent validity of the image distortion method, but the validity of the moveable calliper technique and image marking method remain questionable.

Selection and classification of patients

Important to all studies of patients is the way in which they are selected for inclusion in the research. Most of the British studies of body size perception assessed consecutive attenders at National Health Service clinics, which is a highly satisfactory method of recruitment since patients are not selected according to extraneous social variables such as social class or affluence. Many of the American studies are based on patients attending private clinics or women recruited by advertisements. These women are not necessarily representative of patients with eating disorders in general, and results should be interpreted cautiously with this in mind.

Different studies used different diagnostic criteria for classifying their patient series. This is particularly relevant to studies of patients who experienced bulimic episodes since a morbid fear of fatness is a necessary criterion for a diagnosis of bulimia nervosa but not for bulimia. Certain studies did not state which criteria were used for classifying their patients; and few reported important clinical details about patients, such as stage in treatment. Some studies even failed to present the relative weight in relation to age and height for patients with anorexia nervosa. Since many clinical features have been found to be related to body size overestimation, clinical differences between patient samples across studies may again contribute towards inconsistent findings.

Sample size has been a problem in several studies. Some reports were based on small samples of patients (eg. Norris, 1984), which makes results difficult to interpret in view of the large variance in estimations of body size.

Standardised experimental instructions

When examining reports of body size estimation it is necessary to consider the instructions used to direct the subjects. Of the 30 studies discussed, only seven state that the same wording was used for all subjects. This is important because there are several indications that precise wording may affect estimations. Proctor and Morley (1986), in a rigorous examination of the effect of different sets of instructions, found that estimations changed with different instructions;

and that compared with control subjects, patients with anorexia nervosa were more influenced by the experimenter's words. Crisp and Kalucy (1974) had patients with anorexia nervosa re-estimate their body size after reminding them about their thinness and inviting each patient to *drop your guard*; and they found that estimations decreased. The authors interpreted more accurate estimations as reflecting more honest responses established in *an overall therapeutic relationship*, but it is possible that changed estimations were a compliant response to the perceived demands of the experimenter.

Directional differences

All studies which used the moveable calliper technique or the image distortion method included at least one trial with the stimulus moved from its widest setting and one trial from the narrowest setting; and then derived the mean estimation made from both directions. This procedure is known as the *method of limits* and is commonly used in psychophysics experiments (Woodworth and Schlosberg, 1950). Such experiments usually find that estimations made from an incrementing stimulus are smaller than estimations made from a decrementing stimulus, and this difference is discussed in a number of basic texts (eg. Woodworth and Schlosberg, 1950).

Only one study (Whitehouse et al, 1986) presented estimations of body size made from initially wide and narrow stimuli separately, and reported a large and significant difference between these two trials. Indeed, the difference between directions was greater than the difference between the averaged estimations of patients and controls. Other studies make no mention of directional differences, and their possible significance is not known.

Control of equipment

Studies which used the moveable calliper technique or the image distortion method differ in the degree of control the subject had over the equipment. Some studies allowed the subject to move the markers or image width, while in other studies the subject directed the experimenter to adjust the equipment. Some studies fail to state how the equipment was controlled. Compared with experimenter-controlled equipment, it is likely that when subjects themselves controlled the equipment they were able to make finer adjustments to their estimations, which suggests that their estimations across trials may have been more consistent.

A further methodological consideration concerns the speed at which the markers or image width changed when adjusted. Compared with slow moving markers or images, faster changing ones were likely to have introduced greater variability since the subject had less control over adjusting each estimation.

More specific methodological considerations

Other methodological considerations apply to specific methods of measuring body size perception.

Many variations on the moveable calliper technique have appeared in the literature, and differences between studies include discrete versus continuous markers; points of light versus pointers for the markers; the height of the markers in relation to the body part being estimated; mechanical versus electrically controlled markers; and a dark versus a lit testing room. These differences probably contribute towards contrary findings between studies.

With image distortion methods the amount of distortion has varied between studies. In an early report using this method (Allebeck et al,1976), image width varied by 15 percent of correct size. In subsequent studies greater degrees of distortion were introduced. Compared with limited levels of distortion, large degrees of distortion are likely to have introduced a greater range of responses. In certain studies the degree of narrow distortion was less than the degree of wide distortion. A greater degree of wide distortion is likely to shift the average estimation in the direction of a wide estimate ie. greater wide distortion will bias estimations in favour of overestimation, because there is greater potential to overestimate than underestimate.

In studies which used the image distortion method, some reported equipment which did not allow extreme levels of distortion and found that the extent of distortion constrained estimations, ie. *floor* and *ceiling* effects appear in the data. These are likely to influence the overall group mean. Other factors which possibly influence estimations are the size of the screen and the distance between the subject and the screen. Few studies report such details. With a large screen, adjusting image width makes little visible change to the image; whereas the same adjustment using a small screen markedly changes image size. Thus, compared with small screens, large screens produce a smaller range of estimations. It is noteworthy that Garner, Garfinkel and their colleagues used a life-size screen and equipment which allowed distortion of up to 20 percent compared with 50 percent in other studies, and reported the smallest range in estimations within groups of subjects. Distance from the screen also affects estimations. When a subject stands close to her image, adjusting image width introduces a visible change; whereas standing further from the screen, a larger adjustment is necessary to introduce a noticeable change in image width.

These factors undoubtedly help to explain why, using image distortion methods, some studies found that patients with eating disorders overestimated their body size, while other studies reported that patients were accurate or underestimated. It is essential to compare the estimations of patients with those of controls tested under precisely the same experimental conditions, since it is *relative* rather than *absolute* overestimation which is important.

A further problem specific to the image distortion method is that in some studies the clarity and contrast of the image in relation to the background varied across image widths. With some image distortion methods wide images were grey and poorly defined, as illustrated by Touyz and his colleagues (Touyz et al,1984). This is problematic for at least three reasons. First, poorly defined images make estimation more difficult since the size of the image is ambiguous. Second, change in contrast and clarity across different widths may provide a cue to correct size because wide images appear grey and blurred compared with a veridical image. Third, perception of size

is influenced by the contrast between foreground and background (Goldstein,1980). These considerations make it difficult to interpret estimations of body size in studies where the image was poorly defined.

Conclusions

The numerous methodological considerations relevant to body size perception make it difficult to interpret the results from many of the studies and therefore findings should be regarded with caution. Most of the studies reported were methodologically unsatisfactory in at least one of the respects discussed. The many methodological differences between studies help to explain inconsistent findings and make it difficult to draw comparisons between studies. In view of the methodological problems discussed it would appear illegitimate to compare results between studies which used different methods of measuring body size perception, although many authors have done so.

Section 4: Concern with shape

Concern with shape in anorexia nervosa

Perhaps the central features of anorexia nervosa are an extreme fear of becoming fat which does not diminish with weight loss, and a relentless pursuit of thinness (Bruch,1973). Fatness is viewed as odious and reprehensible, and extreme importance is placed on achieving and maintaining a thin body shape (Fairburn et al,1986a). Although many young women regard slimness as a desirable attribute, patients with anorexia nervosa hold this attitude to an extreme degree, and weight and shape may become the sole measure of self-worth.

Despite the recognised importance of concern with shape in anorexia nervosa, this aspect of the disorder has received comparatively little research attention. Several studies have used repertory grids to examine attitudes towards shape among these patients (Crisp and Fransella,1972; Feldman,1975; Ben-Tovim et al,1977; Fransella and Crisp,1979; Fransella and Button,1983). These studies were intensive and were usually based on small samples of patients, with single case reports being common. Different studies specified different attitudes for evaluating concern with shape, making it difficult to compare findings between studies. Nevertheless, the technique is useful for eliciting maladaptive concerns about shape which may then be addressed in therapy. Other studies have used questionnaires to examine attitudes to body shape in anorexia nervosa. Buvat-Herbaut (1983) reported that one third of a group of patients with anorexia nervosa thought that certain parts of their body were too big. Garner et al (1983) reported that compared with normal young women, patients with anorexia nervosa were more dissatisfied with specific parts of their body.

Examining change in concern with shape during treatment for anorexia nervosa, Garner et al (1983) reported that recovered patients were no more dissatisfied with specific parts of their body than normal young women. Morgan and Russell (1975) used a standardised interview to measure

concern with appearance and fatness, and reported that several years after weight restoration patients still experienced a high level of concern with their shape, felt fat and were markedly afraid of becoming fat.

Despite the suggestions that patients with anorexia nervosa show a high level of concern with their shape, there has been no systematic empirical study of this concern, probably because there has been no satisfactory published measure of such concern in the clinical literature. All the reports on concern with shape among patients with anorexia nervosa have been based either on clinical observation (eg. Bruch,1962), or on unvalidated interviews with no standardised coding scheme (eg. Morgan and Russell,1975), or else simply examined dissatisfaction with specific body parts (eg. Garner et al,1983). Therefore, no firm conclusions about the significance of concern with shape among patients with anorexia nervosa may be drawn from these studies.

Summary

The few studies of concern with shape among patients with anorexia nervosa suggest that these patients may be dissatisfied with their body shape, feel fat and are markedly afraid of becoming fat; and that a fear of fatness and feeling fat may persist after weight restoration. However, no study has used a satisfactory measure of concern with shape, and therefore no firm conclusions may be drawn about the nature, prevalence or course of concern with shape in anorexia nervosa.

Concern with shape in bulimia nervosa

Similar to anorexia nervosa, perhaps the most prominent psychopathological features of bulimia nervosa are extreme views about the importance of attaining a slim body shape and a morbid fear of becoming fat (Cooper and Cooper,1987). Patients with bulimia nervosa are highly sensitive about their shape. In addition to frequent weighing, some patients assess their size by the tightness of their clothes, by scrutinizing themselves in a mirror and measuring their body size. Some find their appearance so unsightly and distressing that they shun any situation where they might see themselves, by avoiding communal changing rooms, undressing in the dark and even bathing while wearing clothes (Fairburn et al,1986a). Such extreme degrees of body shape disparagement are similar to those observed in some obese patients (Stunkard and Mendelson,1961,1967), although the majority of women with bulimia nervosa are of normal weight (Fairburn and Cooper,1984a).

Despite the apparent prominence of concern with shape in bulimia nervosa, there has been very little empirical study of this concern. Several studies used the *Body Dissatisfaction* subscale of the Eating Disorder Inventory (Garner et al,1983), a self-report measure, to examine dissatisfaction with specific body parts among patients with bulimia. One study (Whitehouse et al,1986) reported that these patients were more dissatisfied with their body than normal young women; and one other study (Garner et al,1985) reported that patients with bulimia were more dissatisfied with their body than patients with anorexia nervosa. Wooley and Kearney-Cooke

(1986) examined dissatisfaction with body parts before and after treatment for bulimia, and found that such dissatisfaction was markedly reduced at the end of treatment. This change was consistent with general clinical improvement and was maintained at follow-up one year later. There has been only one study of concern with shape in patients with bulimia or bulimia nervosa which has not examined dissatisfaction with specific body parts (Fairburn and Cooper, 1984a). In a study of a consecutive series of patients with bulimia nervosa who were assessed using a clinical interview, 29 percent experienced disparaging feelings towards their body shape and 86 percent showed an extreme fear of fatness, although few pursued extreme thinness. However, this study also had limitations, in that an unstandardised clinical interview was used with only limited attention paid to concern with shape. There has been no study of the specific nature of concern with shape in bulimia nervosa, together with antecedents and behavioural consequences of such concern.

Summary

There are preliminary indications that patients with bulimia nervosa show a high level of concern with their shape. However, similar to anorexia nervosa, no study has used a satisfactory measure of this concern. Therefore, no firm conclusions may be drawn about the nature and significance of concern with shape in bulimia nervosa.

Concern with shape in the obese

Concern with shape is often an important issue for obese people, which is not surprising given society's hostile attitudes towards being overweight. Indeed, Bruch (1973) suggested that our social climate praises slenderness to such a degree that it is astounding that not all fat people suffer from feelings of disgust and self-hatred. Many studies have shown that, compared with normal weight people, fat people are less liked and more negatively evaluated. For example, Worsley (1981) reported that among the many negative attributes applied to the obese, fat people were rated as stupid, unattractive, weak-willed, lazy and unhealthy.

Stunkard and Mendelson (1961, 1967) were perhaps the first to suggest that some obese people show a *disturbance in body image*, in that some of their patients interpreted a wide range of experiences with self-reference to their weight which became their sole concern. These obese patients viewed their body with hateful self-devaluation, finding it grotesque and loathsome, and believed that others viewed them with horror and contempt. The disturbance markedly affected their emotional and social behaviour, often leading to extreme social isolation. They were reported to feel immensely self-conscious of their appearance, experience extreme distress on seeing their reflection, were inhibited with and avoided the opposite sex, and envied thinner people. Often they avoided eating with others and in public places due to their shame at being fat, shunned social gatherings, were concerned about fitting through narrow spaces and about taking up too much space (such as when sharing a seat), avoided running, avoided communal changing rooms and swimming pools, and wore baggy clothes designed to hide their body (Stunkard and

Mendelson,1961,1967; Stunkard and Burt,1967; Stunkard,1976; Rand and Stunkard,1978). The intensity of these disparaging concerns with shape were noted to be labile, even over short periods of time. At times of positive affect such concerns were slight or absent. However, during a depressed mood, obesity became the focus of all unpleasant things in the overweight person's life, and the explanation of all their unhappiness (Stunkard and Burt,1961).

Not all obese people were noted to experience these disparaging feelings. Stunkard and Mendelson (1961,1967) observed that body shape disparagement was first manifest during late adolescence and that three setting conditions were necessary. First, the onset of obesity occurring before adulthood. Intense derogatory attitudes towards body shape were rarely found among those not obese during childhood. Second, *the presence of neurosis*, often following from a disturbed family environment. Third, negative evaluation of the obesity by significant people in the person's life. Stunkard and his colleagues concluded that the disturbed adolescent incorporated the derogatory views of his parents or peers into an enduring view of himself.

Concerns about body shape have been studied before and after weight reduction among the obese. Two studies reported that derogatory attitudes towards body shape experienced by obese patients decreased with weight loss (Kalucy and Crisp,1974; Solow et al,1974); three studies found that such feelings were unaffected by weight loss (Stunkard and Burt,1967; Schiebel and Castelnovo-Tedesco,1977; Pearlson et al,1981); and two studies reported that the obese still felt too large after reducing (Kalucy and Crisp,1974; Glucksman et al,1968). Stunkard and his colleagues concluded that *Body image disparagement is a chronic intractable disorder, strongly resistant to change* (Rand and Stunkard,1978). Discrepant findings between studies may reflect differences between the patient populations studied and different methods of treatment used. Some patients were treated primarily for their obesity while others were treated for emotional problems independent of their weight. Some were treated using a restricted diet, others by surgery involving no dietary restraint, and others by psychotherapy. Patient populations also differed considerably in the degree to which they were overweight.

Summary

Intense body shape disparagement has been found among a subgroup of obese patients and exerts a debilitating effect on sufferers' lives. This disturbance has been associated with receiving derogatory comments about weight and shape during childhood from family and peers. Although findings are inconsistent, there is some evidence to suggest that such feelings may remain unchanged by weight loss.

Concern with shape among women in the community

Similar to patients with eating disorders, women in the community often show concern with their shape, although usually in attenuated form. A slim body shape is important to most women and feeling fat is common (Rodin et al,1984; Wooley and Wooley,1984). In a study of a consecutive series of women attending a British family planning clinic, 60 percent of the sample

reported that they *persistently felt fat*, 21 percent were *terrified of being overweight*, and 18 percent were *preoccupied with the thought of having fat on their body* (Cooper and Fairburn,1983).

Many women are dissatisfied with their body shape. In a relatively early questionnaire survey carried out by the popular American magazine *Psychology Today* (Berscheid et al,1972,1973), women were generally found to be more dissatisfied with their body compared with men, although there was considerable variability in the degree of dissatisfaction. Younger responders were more dissatisfied than older responders. Those teased about their appearance during childhood were generally dissatisfied with their adult appearance, particularly when the teasing was by important people in the person's life, such as parents; and those who rated themselves as unattractive during adolescence also rated themselves as unhappy adults. These findings were consistent with Stunkard and Mendelson's (1961,1967) observations that body shape disparagement arises during adolescence and has enduring psychological effects.

A similar *Psychology Today* survey was conducted in 1985 and many of the earlier findings were replicated (Cash et al,1986). However, compared with 1972 female responders, 1985 responders were even less satisfied with their body, and such dissatisfaction was associated with bingeing, purging and dieting behaviour. Sixty-three percent of the 1985 responders were *afraid of becoming fat* (although no comparison rate was presented in the earlier study). In another American magazine survey, 75 percent of female responders reported *feeling fat* (Wooley and Wooley,1984).

Among the many other studies of body dissatisfaction among women, dissatisfaction has been associated with degree of overweight (Gray,1977), dieting and restrained eating (Dent,1981), (Blanchard and Frost,1983), emotional eating (Striegel-Moore et al,1986), anxiety (Johnson,1956; Goldberg and Folkins,1974) and low self-esteem (Secord and Jourard,1953; Berscheid et al,1973, Lerner et al,1976). A consistent finding is that depressed mood is an important associated factor: four studies (Goldberg and Folkins,1974; Berscheid et al,1973; Marsella et al,1981; Noles et al,1985) reported that, compared with women who were satisfied with their appearance, those who were dissatisfied were also more depressed. Thus, body dissatisfaction appears to be associated with disturbed eating behaviour and psychological distress.

Dissatisfaction with shape has been reported to begin early in life for the female population and is widespread by the teenage years (Buvat-Herbaut et al,1983; Clifford,1971; Crisp,1977; Davies and Furnham,1986; Druss and Silverman,1979; Dwyer et al,1967; Guggenheim et al,1977; Huenemann et al,1966; Nylander,1971; Rodin et al,1984; Wardle and Beales,1986). The degree of such dissatisfaction is much higher among girls than boys (Clifford,1971; Crisp,1977; Guggenheim et al,1977; Simmons and Rosenberg,1975; Nylander,1971; Wardle and Beales,1986), and boys show very different concerns with their body (Wardle and Beales,1986). Adolescent girls commonly experience their body as being too big (Clifford,1971, Buvat-Herbaut et al,1983; Crisp,1977; Guggenheim et al,1977; Huenemann et al,1966; Dwyer et al,1967), are preoccupied

with their body shape (Buvat-Herbaut et al,1983), and feel fat (Crisp,1977; Druss and Silverman,1979; Huenemann et al,1966; Nylander,1971; Wardle and Beales,1986). Such dissatisfaction is typically centred on fleshy body areas such as the waist, hips and thighs (Clifford,1971; Davies and Furnham,1986; Guggenheim et al,1977; Huenemann et al,1966). Dissatisfaction with body shape and feelings of fatness have been reported to motivate dieting which is widespread among teenage girls (Crisp,1977; Davies and Furnham,1986; Druss and Silverman,1979; Dwyer et al,1967; Guggenheim et al,1977; Huenemann et al,1966; Nylander,1971; Wardle and Beales,1986), and evokes feelings of guilt after eating (Wardle and Beales,1986). Thus, concern with fatness and shape appears to be widespread among teenage girls, and has been associated with dieting.

The prevalence of concern with shape has been reported to increase during the teenage years (Huenemann et al,1966; Nylander,1971). Simmons and Rosenberg (1975) found that 50 percent of girls aged between eight and 11 were dissatisfied with their body, and that dissatisfaction markedly increased during adolescence. However, one study (Wardle and Beales,1986) found that 12 year old girls showed a similar and distressing degree of concern with fatness compared with young women of 18. It is important to know the age at which such maladaptive concerns arise, but as yet no study has used an adequate measure to be able to determine when these feelings first emerge.

Similar to studies of concern with shape among patients with eating disorders, the findings from the studies of concern with shape among women in the community must be interpreted with caution. None used a satisfactory validated measure of such concern. They either examined dissatisfaction with body parts not specifically associated with shape (eg. Berscheid et al,1972), or examined perception of sexual attractiveness (eg. Cash et al, 1985), or simply asked respondents whether they *felt fat* (eg. Nylander,1971), or asked respondents to rate their shape on a simple scale of fatness (eg. Wardle and Beales,1986). The use of unsatisfactory measures of concern with shape makes results difficult to interpret.

Summary

It has been suggested that feeling fat and body dissatisfaction may be widespread among adult women and may be associated with disturbed eating behaviour and psychological disturbance. Dissatisfaction with appearance may also be common among teenage girls, but the age at which concern with shape arises is not known. These suggestions must be regarded with caution since they are based on unsatisfactory measures of concern with shape.

Section 5: Summary and general discussion

From the many studies of body image which have appeared in the clinical literature, despite methodological problems and inadequate measures, findings suggest that some patients with eating disorders do appear to show *a disturbance in body image* in that they overestimate their body

size, are markedly dissatisfied with a normal size or are satisfied with a very thin size, place extreme importance on being slim, and may show a high level of concern with their shape. However, these factors are not invariably found among patients with eating disorders; and they have sometimes been found among normal women, and are therefore not pathognomic of the eating disorders.

The extreme importance placed on shape among patients with eating disorders may be more than simply one of many symptoms of the disorders and may be of central importance. Indeed, it has been argued that attitudes towards shape and weight constitute cardinal features of anorexia nervosa (Bruch,1973) and bulimia nervosa (Fairburn et al,1986a), which distinguish these conditions from other psychiatric disorders. Given these attitudes, many other features of the disorders become understandable, and it has been suggested that such attitudes may be important in maintaining many of the other symptoms (Fairburn et al,1986a). Morgan and Russell (1975) observed that the most common reason why patients with anorexia nervosa refused to eat was because of a fear of becoming fat or feeling fat. Fairburn and his colleagues have suggested that, in view of the extreme importance placed on shape and weight, extreme dieting, frequent weighing, sensitivity to change in shape, self-induced vomiting and laxative abuse all become understandable. Even bulimic episodes can be interpreted as secondary to the fundamental values concerning shape and weight, since severe dietary restraint may precipitate overeating (Herman and Mack,1975). The cognitive model of the maintenance of the eating disorders proposed by Fairburn and his colleagues has important implications for prognosis. As long as a patient with anorexia nervosa evaluates her self-worth according to how thin she is she will be at risk for further weight loss, particularly after weight restoration; and as long as a patient with bulimia nervosa has a marked fear of fatness she will attempt to avoid becoming fat by dieting, inducing vomiting and abusing laxatives, which in turn may encourage gross overeating. Consistent with Bruch's contention that a realistic body image is a precondition for recovery from anorexia nervosa, Fairburn et al (1986a) suggested that a change in maladaptive beliefs about shape may be necessary for a full and lasting recovery from an eating disorder.

Various ideas have appeared in the literature that attempt to explain why some patients with eating disorders overestimate their size, including a failure to adapt to a change in size following a change in weight (Slade,1977), heightened concern with body size (Slade,1977), denial of illness (Crisp and Kalucy,1974), regression to a pre-menarchal state (Crisp and Kalucy,1974), and a failure of cognitive development (Bruch, 1973). There is little empirical support for these ideas. However, one plausible explanation of body size overestimation encompasses the dysfunctional beliefs about shape described above. Garner and Garfinkel (1981) observed that patients with anorexia nervosa commonly show low self-esteem, and that body size and shape become a measure of self-evaluation. They suggested that if an individual equates low self-worth with fatness, and if she evaluates herself negatively, then she may see herself as larger than her true size. This hypothesis may be extended to include concern with fatness. Given that fatness is

negatively evaluated, then negative personal appraisal may lead to heightened concern with shape and feeling fat.

The suggested association between negative personal appraisal, concern with shape and disturbances in body size perception is consistent with ideas in Beck's cognitive model of depression. Depressed mood is almost invariably associated with a sense of general self-depreciation (Beck,1973). Beck observed that the distorted thinking which typically accompanies depression commonly extends to feelings about physical appearance, particularly among women. A depressed patient often becomes preoccupied with the thought of getting fat. Indeed, Beck stated that *Sometimes the patient may believe that (s)he has grown fat even though there is no objective evidence to support this* (Beck,1973). Given the belief that one is getting fat or is fat, it is conceivable that this may lead to overestimating body size. However, not all who are depressed feel fat or overestimate their size. Therefore there must be a mediating factor between feeling fat, body size overestimation and depressed mood. That mediating factor may be the overall importance placed on a slim body shape. Only when body shape is highly valued will negative self-appraisal exacerbate concern with shape and perception of body size. Body shape becomes the *Achilles heel* of such people. Conversely, if body shape is unimportant then negative self-appraisal will affect some other valued personal attribute. This hypothesis is consistent with Beck's observation that depressed mood is associated with increased concern with fatness more commonly among women than men, since slimness is more important to women (Rodin et al,1984).

The hypothesis that depressed mood may exacerbate concern with shape and disturbances in body size perception among women for whom shape is important, is consistent with some of the findings in the research literature. In the review presented above, depressed mood, dissatisfaction with body shape, and low self-esteem were all associated with body size overestimation among women with eating disorders, and all are conceptually related to negative self-appraisal. Furthermore, depression was also associated with dissatisfaction with body shape among women in general and not simply among patients with eating disorders.

Thus, disturbances in body size perception and a high level of concern with shape appear to be characteristic of women with eating disorders, but are also found among some women in the community. There is tentative evidence to suggest that these disturbances in body image may be related to depressed mood and feelings of general self-depreciation.

Section 6: General aims

In view of the suggested importance of body size and shape to many women, the general aim of the ensuing studies was to investigate further the nature and significance of body image disturbance in the form of disturbances in body size perception and concern with shape:

(1)

There has been considerable research into body size overestimation among patients with anorexia nervosa, and the reports by Garfinkel, Garner and their colleagues have been methodologically sound in terms of the measure used to assess body size perception and the samples studied. There has been no comparable research into body size perception among patients with bulimia nervosa. The few published studies on body size perception among patients with bulimic disorders have all been unsatisfactory for a number of reasons: they were based on poorly defined or poorly described samples of patients, or on a small number of patients, or included no control comparison group; or used a method of measuring body size perception whose test re-test reliability and concurrent validity are questionable; or did not examine aspects of body size perception aside from overestimation; or did not examine the significance of perceptual disturbances in terms of their relationship with other features of the disorder or outcome from the disorder.

Therefore, the first aim was to investigate disturbances in body size perception among patients with bulimia nervosa and to examine the significance of such disturbances.

(2)

Disturbances in body size perception have been found among patients with eating disorders but have also been found among some women in the community. It is therefore conceivable that factors common but not exclusive to the eating disorders may give rise to disturbances in body size perception. Several studies have suggested that depressed mood may be related to disturbances in body size perception among patients with eating disorders. A hypothesis was outlined above which suggested that negative self-appraisal as a symptom of depressed mood may be associated with disturbances in body size perception, particularly among women who place great importance on shape.

Therefore, the second aim was to investigate the relationship between depressed mood, concern with shape and disturbances in body size perception among women in the community, and to test the hypothesis that depressed mood may exacerbate disturbances in body size perception.

(3)

Although it has been alleged that concern with shape is of central importance in bulimia nervosa, there has been no satisfactory empirical study of such concern among these patients. This is at least partly because there has been no adequate measure of concern with shape.

Therefore, the third aim was to develop a satisfactory measure of concern with shape, and to investigate the nature and significance of concern with shape among patients with bulimia nervosa in terms of the relationship between such concern and other clinical features of the disorder and outcome from the disorder.

(4)

It has been suggested that a slim shape is important to the majority of women in the community, and that from a young age many show a high level of concern with their shape. There have been tentative indications that such concern may be related to demographic variables, disturbed eating behaviour and a number of indices of psychological distress. However, there has been no satisfactory study of the nature and significance of concern with shape among women in the community.

Therefore, *the fourth aim was to investigate concern with shape among women in the community in terms of the relationship between such concern, and demographic factors, behavioural disturbance and mental state.*

Chapter 2

The Development and Validation of The Body Shape Questionnaire

Introduction

An extreme degree of sensitivity towards body shape constitutes a central feature of bulimia nervosa, as was discussed in Chapter 1. Patients suffering from the disorder are highly concerned with fatness, and place great importance on achieving and maintaining slim body shape (Cooper and Cooper, 1987). Indeed, *a morbid fear of becoming fat* is one of the three necessary criteria for diagnosing the disorder (Russell, 1979). Nevertheless, the intensity of concern with shape shown by these patients may range from dissatisfaction with specific body parts to extreme body shape disparagement in which patients find their body loathsome and repulsive. Such concerns about body shape may manifest in abnormal and maladaptive behaviour, such as frequent measuring of body parts and avoidance of exposure. Indeed, it has been suggested that an extreme level of concern with shape may be important in the maintenance of the eating disorder (Fairburn et al, 1986a). Despite the importance of concern with fatness and shape in bulimia nervosa, there have been surprisingly few attempts to study this concern systematically, which is an important omission. Measuring this aspect of the specific psychopathology of the disorder would help to determine its clinical significance in terms of its relationship with severity of other symptoms and outcome from the eating disorder.

Concern with shape appears to be common among women with no eating disorder, and most women report *feeling fat* (Wooley and Wooley, 1984). Such concerns are rife by the adolescent years (eg. Wardle and Beales, 1986), and have been related to a range of maladaptive attitudes and behaviour both specifically associated with eating (eg. dieting, Dwyer et al, 1967; and feelings of guilt after eating, Wardle and Beales, 1986), and with more general disturbance (eg. depressed mood, Goldberg and Folkins, 1974, Berscheid et al, 1973, Marsella et al, 1981, Noles et al, 1985; and low self-esteem, Secord and Jourard, 1953, Berscheid et al, 1973, Lerner et al, 1976). It is conceivable that a high level of concern with shape may evoke considerable distress in sufferers' lives, although again there have been few attempts to study systematically the nature and significance of such concern.

The dearth of research into concern with shape is at least partly due to there being no satisfactory measure of this concern. Various psychometric instruments assess bodily concerns but are unsatisfactory for measuring specific concern with body shape for a number of reasons which will be discussed.

Review of the relevant measures

Several projective tests have been designed to assess bodily concern, such as *Draw-A-Person* tests, and adaptations of the Rorschach ink blots test; but these are confounded by problems with interpretation and will not be discussed. Eight published measures are relevant to concern with body shape. Seven are in the form of self-report questionnaires, and one is a semi-structured

interview.

Four of the existing measures assess satisfaction with specific body parts: the Body Cathexis Scale (Secord and Jourard,1953), the Body Image Satisfaction Scale (Marsella et al,1981), the Body Image Questionnaire (Berscheid et al,1972), and the *Body Dissatisfaction* subscale of the Eating Disorder Inventory or EDI (Garner et al,1983). The first two simply list various body areas and respondents rate their degree of satisfaction with each area. The Body Image Questionnaire, in addition to satisfaction, includes a number of other items about the importance of appearance. The *Body Dissatisfaction* subscale of the EDI asks respondents to rate a small number of body parts in terms of satisfaction with size. The other four measures assess bodily concern aside from dissatisfaction. The Body Distortion Questionnaire (Fisher,1970) has nine subscales which deal with unpleasant bodily sensations, such as constipation and feelings of being too large. The *Appearance* subscale of the Food Fitness and Looks Questionnaire (Hall et al,1983) assesses attitudes towards cosmetic appearance. The Body Self Relations Questionnaire (Winstead and Cash,1984) has three subscales dealing with attitudes and behaviour associated with appearance, emphasising sexual attractiveness. The Eating Disorder Examination or EDE (Cooper and Fairburn,1987) is a semi-structured clinical interview comprising 62 items, 11 of which are directly relevant to concern with body shape. Since this interview was not designed to assess specific concern with shape it does not always distinguish such concern from concern with weight. In addition, since the EDE was intended for making detailed clinical assessments of patients with eating disorders it requires a trained interviewer and is unsuitable for assessing large numbers of women.

The eight published measures are of limited use for assessing concern with body shape for four main reasons. First, since only the *Body Dissatisfaction* subscale of the EDI was designed specifically to measure concern with shape as it arises in patients with eating disorders, many questions included in the measures are irrelevant to such concern. Second, although body dissatisfaction is an important aspect of concern with shape, it is only one aspect. None of the measures capture the central importance of such concerns, together with their antecedents and behavioural consequences. Third, authors commonly fail to state how items were generated (eg. Secord and Jourard,1953; Berscheid et al,1972), or say they were derived from *clinical experience* (eg. Garner et al,1983), or *intuitively* from *brainstorming sessions* (eg. Hall et al,1983), and it is possible that important aspects of concern with shape may have been omitted and unimportant ones included. Fourth, only one of the measures ie. the Eating Disorder Examination (Cooper and Fairburn,1987), includes a time scale over which responses are rated, which is important unless it is shown that concern with shape is stable over time. The concern reported by patients appears to vary in frequency and intensity but its lability has not been assessed. Also such concern may change during treatment for an eating disorder, as suggested by a study by Wooley and Kearney-Cooke (1986), and in order to assess change it is essential to define a period of time over which to rate concern with shape.

Development of the Body Shape Questionnaire

In view of the limitations of the existing assessment instruments, there was a need for a measure to assess concern with shape, which would encompass more than dissatisfaction and include a time scale upon which to rate responses. A new measure, the Body Shape Questionnaire, or BSQ was developed to satisfy these requirements. A self-report questionnaire was chosen because it is easy to administer and does not require a trained rater.

BSQ items were empirically derived from a semi-structured interview (Appendix 3) based on the concerns about body shape reported by patients with eating disorders. The interview encouraged interviewees to talk spontaneously, and was based on three aspects of concern with shape; the thoughts surrounding feeling fat, the circumstances which precede these thoughts and feelings, and behaviour which usually follows them. Twenty-eight women were interviewed:

- (1) Six patients suffering from bulimia nervosa who satisfied Russell's (1979) criteria;
- (2) Four patients suffering from anorexia nervosa who satisfied the research diagnostic criteria of Feighner et al (1972);
- (3) Seven women who were dieting to lose weight;
- (4) Three women who attended vigorous exercise classes;
- (5) Eight normal young women with no specific concerns about weight or shape, or problems with eating.

These women were selected on the basis of their availability and no effort was made to attain representative samples of each group. Their age and weight are shown in Table 2.1.

Table 2.1
Age and weight of the women interviewed

	N	Age \bar{x}/sd	MPMW ¹ \bar{x}/sd
Bulimia Nervosa Patients	6	22.0 4.3	105.0 10.7
Anorexia Nervosa Patients	4	20.3 1.6	77.6 7.2
Dieters	7	19.5 1.0	108.6 5.3
Exercisers	3	31.7 0.9	91.0 4.6
Normal Women	8	20.9 3.6	100.8 7.4

1 Weight in pounds expressed as a percentage of average weight, matched for age, height and sex (Geigy, 1962)

Interviews lasted between 30 minutes and an hour and were recorded and subsequently transcribed. The information thus collected was collated into similar topics discussed by different women. This resulted in 77 topics about concerns with body shape and fatness, and behaviour which preceded and followed these concerns. Examining these 77 topics, 26 were eliminated because they were conceptually similar to other topics, or because they had not been discussed by at least two women (Appendix 4). Fifty-one topics remained and a question was generated for each (Appendix 5).

At the beginning of the questionnaire subjects were asked to respond to the items in terms of frequency of occurrence over the past month on a six-point Likert scale consisting of *Never*, *Rarely*, *Sometimes*, *Often*, *Very Often* and *Always*.

Item Reversal

It would have been desirable if half the items on the BSQ could have been negatively keyed to avoid the possibility of response-set. However, an examination of the items indicated that it was not possible to reverse satisfactorily the wording of most questions for three reasons:

- (a) Reversal introduced double negatives which could confuse subjects: eg.
 - (i) Have you felt excessively large and rounded? /*Never*
 - (ii) Have you not felt excessively large and rounded? /*Never*
- (b) Reversing the meaning of a word did not necessarily reverse the meaning of the question: eg.
 - (i) Have you felt excessively large and rounded?
 - (ii) Have you felt excessively small and square?
- (c) Reversing the meaning of a word resulted in the reversed item having two likely interpretations: eg. A response of *Never* to b(i) has one *obvious* meaning ie. the subject has not felt excessively large and rounded. A response of *Never* to b(ii) has two likely interpretations; either the subject feels large and rounded, or the subject may not think about her body size.

Due to the difficulties with reversing items they were kept in the form where all are keyed in the same direction. This has the advantage that the questions are clear and unambiguous but introduces the possibility of response-set. The questionnaire was intended to measure concern with shape and there was no reason to believe that women who differ in the level of such concern will differ in their tendency to endorse questions positively or negatively. Therefore leaving all items keyed in the same direction does not appear to be a problem for interpreting scores on the questionnaire.

Further development and validation of the BSQ

Having developed the BSQ it was necessary to refine and validate this new measure. Validation was based on clinical reports that patients with bulimia nervosa show disturbed eating attitudes and behaviour and an extreme level of concern with their shape (Fairburn and Cooper, 1984a). Four predictions were made:

- (1) Compared with women in the community, patients with bulimia nervosa will score higher on the BSQ;
- (2) The BSQ will be related to other measures of concern with shape;
- (3) Among women in the community, a high score on the BSQ will be associated with disturbed eating attitudes and behaviour;
- (4) Women in the community who report symptoms of bulimia nervosa will score similarly on the BSQ compared with patients with a clinical diagnosis of bulimia nervosa, and significantly higher than women who report no symptoms of the disorder.

Method

Subjects

Subjects were members of the following four groups:

- (i) *Bulimia nervosa patients*: 38 female patients were consecutively referred to two outpatient clinics between September 1985 and March 1986, and were included in the study if they satisfied Russell's (1979) diagnostic criteria for bulimia nervosa, or DSM III-R criteria for bulimic disorder (American Psychiatric Association, 1987) (Appendix 2).¹ For some analyses it was possible to add 34 subsequent referrals who met these criteria, making a total sample of 72 patients;
- (ii) *Undergraduate students*: 85 women in two undergraduate colleges were approached and asked to participate in a study of particular relevance to women;
- (iii) *Occupational Therapy or O.T. students*: 132 occupational therapy students, the total number in two training classes were asked to participate in a *Questionnaire Survey*.
- (iv) *Family Planning Clinic Attenders*: 371 female consecutive attenders at two family planning clinics were asked to participate in a *Questionnaire Survey*.

Procedure

To test prediction 1: Group differences in BSQ scores

All subjects were asked to complete the BSQ and additional questions, and except for patients with bulimia nervosa responses were anonymous. All patients and undergraduate students returned satisfactorily completed questionnaires. Of the O.T. students, 90.2 percent complied.

The family planning clinic attenders were asked to complete the BSQ and a background information sheet while waiting to see the doctor. Two hundred and seventy-six were able to complete the questions while waiting, and 13 either refused or returned blank questionnaires, a response rate of 95.5 percent of questionnaires completed in the clinic. Eighty-two women were unable to complete the questionnaire before seeing the doctor and were given a stamped addressed envelope with which to return it. Fifty-five, or 67.1 per cent of the 82 women returned their questionnaire by post. Since proportionately fewer questionnaires were returned by post compared with those completed in the clinic, questionnaire items for the two groups were compared using a t-test for independent samples. There were no differences on any item between those completed in the clinic and those returned by post ($P > .05$). It was therefore considered

¹ A diagnosis of bulimia nervosa was made on the basis of a clinical interview by the assessing clinician. The only area of uncertainty within Russell's diagnostic criteria concerns the 'morbid fear of fatness'. It has recently been suggested (Fairburn, in press) that an operational criterion be used for this fear, where shape or weight are one of the main measures of self-evaluation. In the current study all patients scored a rating of at least 4 on questions 44 or 50 of the Eating Disorder Examination (Cooper and Fairburn, 1987), ie. questions concerning the importance of weight and shape. Thus, for all patients, shape or weight was one of the main aspects of self-evaluation.

legitimate to combine the responses of both groups for data analyses, producing an overall return rate of 89.2 percent.

To test prediction 2: Concern with shape

BSQ scores were examined in relation to other measures of concern with shape. Patients with bulimia nervosa completed the *Body Dissatisfaction* subscale of the EDI (Garner et al,1983), which measures dissatisfaction with specific body parts, as was described above. For women in the community concern with body shape was assessed by three questions about whether the women were on a diet to control their weight, how afraid they were of becoming fat, and how important being slim was to them. Responses to the last two questions were made on four-point rating scales consisting of *Not at all*, *Slightly*, *Moderately*, and *Markedly*, for fear of fatness; and *Not at all*, *Slightly*, *Moderately* and *Extremely* for the importance of being slim (Appendices 6 and 7 respectively).

To test prediction 3: Disturbed eating attitudes and behaviour

Patients with bulimia nervosa and O.T. students were asked to complete the Eating Attitudes Test or EAT (Garner and Garfinkel,1979), which is a 40-item questionnaire measuring disturbed eating attitudes and behaviour.

To test prediction 4: Symptoms of bulimia nervosa

O.T. students and family planning clinic attenders were asked to report whether they currently experienced episodes of uncontrollable and excessive overeating; and whether they currently induced vomiting or used laxatives to control their weight.² Women who had experienced at least two episodes of overeating in the past month, and who vomited or used laxatives to control their weight, and who were *Markedly* afraid of becoming fat, were termed *probable cases* of bulimia nervosa. Women who did not overeat, and who did not use vomiting or laxatives to control their weight were termed *definite non-cases* of bulimia nervosa. *Probable cases* were compared on the BSQ with *definite non-cases* and with patients with bulimia nervosa.

Item elimination

Since a short questionnaire was considered desirable, before examining the four predictions for validation, the BSQ was reduced from 51 to 34 items using three methods to eliminate items:

- (1) Inter-relationships between items were examined. For the patients and women in the community 18 items were highly correlated with other items ($r=.60$ or above).³ In six of these pairs the two items appeared to measure very similar phenomena and one item from each pair was eliminated (Appendix 9).

² The data collected from the clinic attenders provided an opportunity to study the prevalence of bulimia nervosa, and findings are summarized in Appendix 8.

³ All correlations reported in this thesis were calculated using Pearson's product moment correlation unless stated otherwise.

- (2) Patients and women in the community were compared on individual BSQ items using a t-test for independent samples. For 50 of the 51 items patients scored significantly higher than the women in the community ($P < .05$). Six items failed to discriminate between patients and women in the community at a highly significant level ($P < .001$) and were discarded (Appendix 10). The item concerning urge to exercise did not discriminate between patients and women in the community at this prescribed level ($P = .011$) but was retained on clinical grounds because it is a feature of anorexia nervosa.
- (3) Items which were endorsed *Often*, *Very Often*, or *Always* by fewer than 25 percent of patients and five percent of women in the community were discarded on the grounds of rarity. Five items were eliminated by this method of endorsement (Appendix 11). The item concerning laxative abuse, although endorsed by only 21 percent of patients, was retained on clinical grounds because it is an important feature of bulimia nervosa, although not highly common.

Item elimination reduced the BSQ from 51 to 34 items. The final 34 item questionnaire is presented in Appendix 12.

Results

Subjects

Table 2.2 shows the age and weight of the samples. The responses of the O.T. students, undergraduate students and family planning clinic attenders were combined for initial analyses and will subsequently be referred to as the responses of women in the community.

Table 2.2
Age and weight of women who completed the BSQ

	Bulimia Nervosa Patients (N=38) \bar{X}/sd	Bulimia Nervosa Patients (N=72) \bar{X}/sd	Under- graduate Students (N=85) \bar{X}/sd	O.T. Students (N=119) \bar{X}/sd	Clinic Attenders (N=331) \bar{X}/sd
Age	22.2 4.1	23.0 4.6	20.0 1.1	21.3 3.2	23.8 6.3
MPMW	102.8 13.9	102.4 14.7	99.8 10.8	98.9 8.9	97.7 11.6

Reliability

The internal reliability of the BSQ was assessed using the combined data from the 535 women in the community and the sample of 72 patients with bulimia nervosa:

- (i) Guttman's coefficient of split-half reliability was 0.94. Examining the divided halves of the BSQ, Cronbach's alpha was high and very similar for both halves; $\alpha=0.94$ for part 1, and $\alpha=0.93$ for part 2.
- (ii) Cronbach's alpha coefficient was computed for all 34 items to indicate internal consistency and to estimate the influence of other sources of sampling error. The coefficient was 0.97.

Thus, the BSQ showed a satisfactory degree of split-half reliability and internal consistency.

Scoring the BSQ

The BSQ is scored according to its rating scale, where a score of 1 is recorded for a response of *Never* and a score of 6 for a response of *Always*. Scores are then totalled, producing a range of possible scores from 34 to 204.

Prediction 1: Group differences in BSQ scores

BSQ total scores for the women in the community and the sample of 38 patients with bulimia nervosa were compared using a t-test for independent samples. The mean score for the patients with bulimia nervosa was 136.9, $sd=22.5$, with a range from 67 to 186; and the mean score for women in the community was 81.5, $sd=28.4$, with a range from 34 to 165. The difference between the two groups was highly significant ($t=11.8$, $df=571$, $P<.001$).⁴ Despite this difference there was some overlap, as illustrated in Figure 2.1. This shows that the degree of concern with shape varied considerably within the sample of patients with bulimia nervosa and the sample of women in the community.

In view of the considerable variability in BSQ scores, responses to the questionnaire were divided into categories based on degree of concern with shape. A score below the mean of the women in the community was labelled *No Concern* ($BSQ \leq 80$); a score within one standard deviation above the mean of the women in the community was labelled *Mild Concern* ($BSQ=81-110$); a score greater than one standard deviation but within two standard deviations of the mean of the women in the community was labelled *Moderate Concern* ($BSQ=111-140$); and a score greater than two standard deviations above the mean of the women in the community was labelled *Marked Concern* ($BSQ>140$), (scores were rounded to the nearest ten). As can be seen from Figure 2.2, using these categories to classify BSQ scores, 87 percent of patients with bulimia nervosa showed *Moderate* or *Marked* concern with their shape, whereas only 17 percent of women in the community showed comparable levels of concern ($\chi^2=103.2$, $df=1$, $P<.001$).

⁴ This discriminant validity was a fundamental requirement of the BSQ. It was to be expected that the patients with bulimia nervosa would score higher on the questionnaire than the women in the community since items which failed to discriminate between the two groups had been discarded. Nevertheless, the patients on average scored considerably higher than the women in the community.

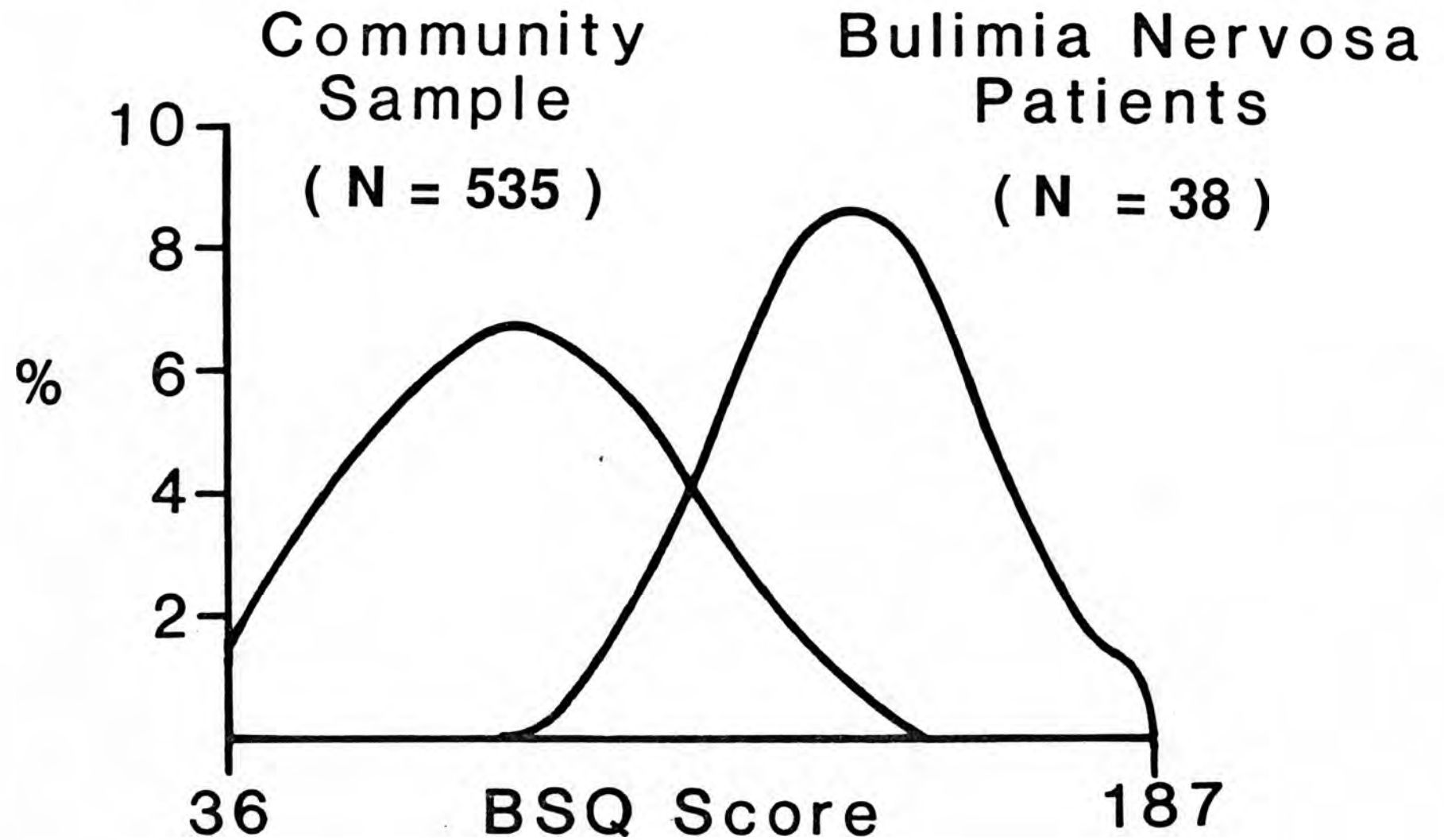


Figure 2.1
Distribution of BSQ scores

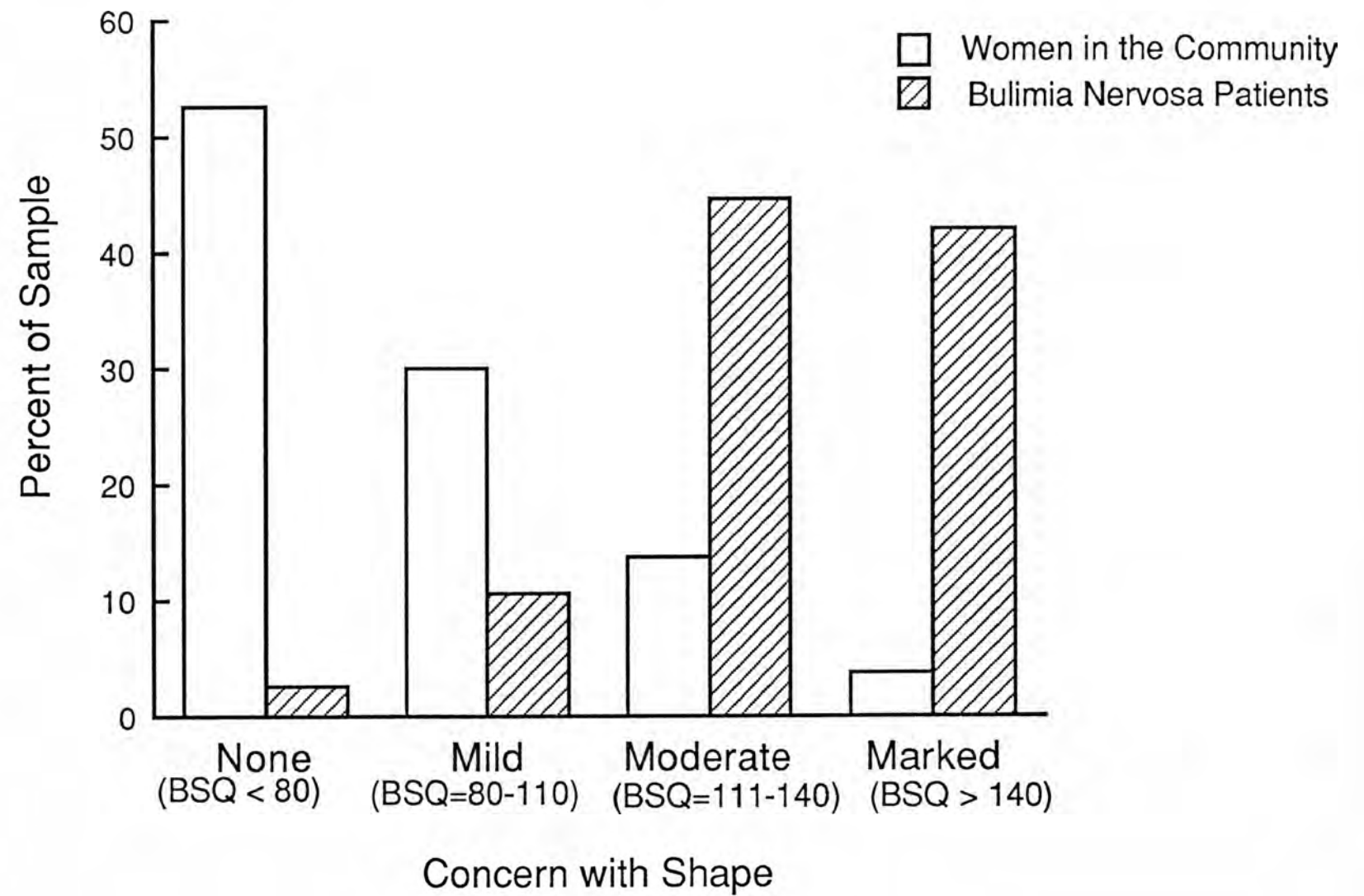


Figure 2.2
Concern with shape among patients with bulimia nervosa (N=38)
and women in the community (N=535)

Thus, prediction 1 was supported in that patients with bulimia nervosa scored significantly higher on the BSQ compared with women in the community.

Prediction 2: Concern with shape

Among the sample of 38 patients with bulimia nervosa, score on the BSQ was highly related to dissatisfaction with body shape as measured by the *Body Dissatisfaction* subscale of the EDI ($r=.66$, $P<.001$).

The women in the community were divided into two groups with high and low concern with their shape: the women were considered to be highly concerned with their shape if they were currently dieting, and if they rated themselves as *Moderately* or *Markedly* afraid of becoming fat, and if they rated slimness as *Moderately* or *Extremely* important ($N=95$); and the women were considered to show little concern with their shape if they were not currently dieting, if they were *Not at all* or only *Slightly* afraid of becoming fat and if they rated slimness as *Not at all* or only *Slightly* important ($N=79$). Using a t-test for independent samples, compared with the low concern group, the high concern group scored significantly higher on the BSQ ($BSQ=55.9$, $sd=14.4$ versus $BSQ=109.0$, $sd=21.2$; $t=19.57$, $df=165.7$, $P<.001$).

Thus, prediction 2 was supported in that concern with shape as measured by the BSQ was significantly associated with other indices of concern with shape.

Prediction 3: Disturbed eating attitudes and behaviour

BSQ scores were significantly related to EAT scores for the sample of 38 patients with bulimia nervosa ($r=.35$, $P<.02$) and for the O.T. students ($r=.61$, $P<.001$).

Thus, prediction 3 was supported in that a high BSQ score was associated with disturbed eating attitudes and behaviour for patients with bulimia nervosa and women in the community.

Prediction 4: Symptoms of bulimia nervosa

Ten women in the community were classified as *probable cases* of bulimia nervosa and were compared with 317 *definite non-cases* and with the sample of 38 patients. Table 2.3 shows that using a one-way analysis of variance and Scheffe's multiple range test, the *probable cases* scored significantly higher on the BSQ compared with the *definite non-cases*; and the *probable cases* did not differ significantly from the patients. However, the assumption of homogeneity of variance was not met⁵ (Cochran's $C=.41$, $P<.05$). Therefore, the BSQ scores of these three groups of women were re-examined using a Kruskal-Wallis non-parametric analysis of variance. Again, *definite non-cases* scored considerably lower than *probable cases* and patients, as is shown in Table 2.3.

Thus, prediction 4 was supported in that *probable cases* of bulimia nervosa scored significantly higher on the BSQ compared with *definite non-cases*, and scored similarly to patients

⁵ In all one-way analyses of variance reported in this thesis the assumption of equal variance between cells was tested using Cochran's C test.

Table 2.3
Group differences in BSQ scores between patients with bulimia nervosa, probable cases of bulimia nervosa, and definite non-cases

	Definite Non-cases (N=317) \bar{x}/sd	Probable Cases (N=10) \bar{x}/sd	Bulimia Nervosa Patients (N=38) \bar{x}/sd			
BSQ	71.9 ¹	129.3	136.9	F=154.5	df=2,362	P<.001
Score	23.6	17.0	22.5			
Mean Ranks	161	326	332	$\chi^2=108.4$		P<.001

1 Significantly different from other groups (P<.05); Scheffe's multiple range test

Factor analysis of the Body Shape Questionnaire

Factor analysis was conducted on the 34 items comprising the BSQ to determine whether the questionnaire measures a unitary dimension of concern with shape, or whether such concern consists of several distinct dimensions.

The questionnaire was factor analysed using the responses of the 535 women in the community and the sample of 72 patients with bulimia nervosa, a total of 607 subjects. Although there were fewer patients than women in the community, the distribution of BSQ scores was approximately normal (Skewness=0.59). It was not possible to conduct factor analysis on a completely normal distribution of scores without omitting a number of patients who scored very highly. This was because among the women in the community there was a cluster of low scores around the minimum of 34 and it was not possible for these women to score much lower; whereas although several patients scored very highly, none approached the maximum score of 204. It was not possible to conduct the analysis on an equal number of patients and women in the community since this would not have constituted an adequate sample size.

Preliminary to factor analysis a correlation matrix was computed to examine relationships between all BSQ items. All of the 561 correlations were statistically significant (P<.00001), which was the first indication that factor analysis of the questionnaire would not prove particularly useful. When conducting such analysis it is desirable that items be highly related to some items and unrelated to others. Since all questions were significantly related to all other questions it was likely that they were all measuring the same underlying construct. However, with such a large

number of subjects a small correlation coefficient may be statistically significant, and it was therefore decided to proceed with factor analysis, bearing in mind that meaningful distinct factors might not emerge.

Bartlett's test of sphericity (14772, $P < .001$) and the Kaiser-Meyer-Olkin measure of sampling adequacy (.98) indicated that the items were sufficiently inter-related to proceed with the analysis. Factors were extracted using principal components analysis. Since the aim of factor analysis is to group individual items into a small number of constructs which explain sample variance, extracted factors were limited to ones with eigen values of one or more. This was because factors with eigen values of less than one are no better at explaining sample variance than individual items. Three factors were extracted, accounting for 51.9 percent, 5.3 percent, and 3.4 percent of the variance respectively, a total of 60.6 percent. Thus, only Factor 1 accounted for a substantial amount of sample variance in BSQ scores, and much of the variance was not explained within the three factor structure.

Items did not fit well onto this unrotated factor structure, with many items showing moderate loadings on more than one factor. To improve the fit between items and factors, the factors were subjected to an oblique rotation. Twenty-seven iterations produced a clearer factor structure, where most items loaded moderately or highly on only one factor. Factor loadings of .3 or above are shown in Table 2.4. It is apparent from this table that BSQ items tend to cluster into three distinct factors, as follows:

Factor 1 appears to measure *General concern with body shape* and comprises 24 questions;

Factor 2 appears to measure *Behaviour characteristic of bulimia nervosa* and comprises four questions;

Factor 3 appears to measure *Bodily self-consciousness* and comprises six questions;

The questions which form these factors are listed in Table 2.5. However, the labels applied to the factors are very general and items which fall under one heading could conceivably also fall under another. For example, items 9, 12, 15, 24, 29 and 33 which load on the general factor could be labelled *Bodily self-consciousness*; and items which load on the *Behaviour characteristic of bulimia nervosa* factor and *Bodily self-consciousness* factor could also come under the heading *General concern with body shape*.

Thus, the BSQ appears to measure a unitary dimension of concern with shape. Three extracted factors failed to account for a substantial amount of sample variance, and conceptually distinct labels could not be applied to the extracted factors.

Table 2.4
Item loadings on the three factors*

Question	Factor 1	Factor 2	Factor 3
34	.93		
2	.82		
17	.81		
22	.79		
21	.77		
6	.74		
4	.73		
23	.73		
3	.71		
15	.69		
5	.67		
9	.66		
28	.63		
30	.63		
14	.63		
12	.62		-.34
10	.62		
29	.60		-.34
1	.58		
24	.57		
16	.51		
11	.49	.44	
25	.48		
33	.46		-.38
32		.81	
26		.65	
18		.60	-.42
13		.53	
8			-.69
27			-.59
20	.40		-.50
7		.44	-.45
19	.43		-.44
31			-.44

* Loadings of .3 or above are shown

Table 2.5
The three extracted factors¹

Factor 1 : General Concern With Body Shape

- 34. Has worry about your shape made you feel you ought to exercise?
- 2. Have you been so worried about your shape that you have been feeling that you ought to diet?
- 17. Has eating sweets, cakes or other high calorie food made you feel fat?
- 22. Have you felt happiest about your shape when your stomach has been empty (eg. in the morning)?
- 21. Has worry about your shape made you diet?
- 6. Has feeling full (eg. after eating a large meal) made you feel fat?
- 4. Have you been afraid that you might become fat (or fatter)?
- 23. Have you thought that you are the shape you are because you lack self-control?
- 3. Have you thought that your thighs, hips or bottom are too large for the rest of you?
- 15. Have you avoided wearing clothes which make you particularly aware of the shape of your body?
- 5. Have you worried about your flesh being not firm enough?
- 9. Has being with thin women made you feel self-conscious about your shape?
- 28. Have you worried about your flesh being dimply?
- 30. Have you pinched areas of your body to see how much fat there is?
- 14. Has being naked, such as when taking a bath, made you feel fat?
- 12. Have you noticed the shape of other women and felt that your own shape compared unfavourably?
- 10. Have you worried about your thighs spreading out when sitting down?
- 29. Has seeing your reflection (eg. in a mirror or shop window) made you feel bad about your shape?
- 1. Has feeling bored made you brood about your shape?
- 24. Have you worried about other people seeing rolls of flesh around your waist or stomach?
- 16. Have you imagined cutting off fleshy areas of your body?
- 11. Has eating even a small amount of food made you feel fat?
- 25. Have you felt that it is not fair that other women are thinner than you?
- 33. Have you been particularly self-conscious about your shape when in the company of other people?

Factor 2 : Behaviour Characteristic of Bulimia nervosa

- 32. Have you taken laxatives in order to feel thinner?
- 26. Have you vomited in order to feel thinner?
- 18. Have you not gone out to social occasions (eg. parties) because you have felt bad about your shape?
- 13. Has thinking about your shape interfered with your ability to concentrate (eg. while watching television, reading, listening to conversations)?

Factor 3 : Bodily Self-Consciousness

- 8. Have you avoided running because your flesh might wobble?
- 27. When in company have you worried about taking up too much room (eg. sitting on a sofa, or a bus seat)?
- 20. Have you felt ashamed of your body?
- 7. Have you felt so bad about your shape that you have cried?
- 19. Have you felt excessively large and rounded?
- 31. Have you avoided situations where people could see your body (eg. communal changing rooms or swimming baths)?

1 Items are ordered according to factor loadings

Discussion

Many young women are concerned with their shape, particularly those with eating disorders, although such concerns have received little empirical investigation because until now there has been no satisfactory measure of this concern. A 34-item self-report questionnaire named the Body Shape Questionnaire (BSQ) was developed specifically to examine such concern. The questionnaire appeared to have a homogeneous factor structure for describing concern with body shape, and although three factors were derived from factor analysis they did not appear to be useful for partitioning this concern. The questionnaire showed a high degree of split-half reliability and internal consistency. It discriminated at a highly significant level between patients with bulimia nervosa and women in the community, and therefore the discriminant validity of the questionnaire was deemed satisfactory. This was to be expected since items which were poor discriminators were eliminated from the final version. Although the BSQ discriminated at a highly significant level between patients with bulimia nervosa and women in the community, there was some overlap between these two groups, with some women in the community showing very high levels of concern with their shape. The questionnaire was not intended to be used as a screening instrument for detecting patients with eating disorders, but as a measure of one aspect of the specific psychopathology which is also present among other women to varying degrees. As such, this overlap is a strength rather than a weakness of the measure. Scores on the BSQ were related

to other indices of concern with shape and general measures of disturbed eating. Thus, the concurrent validity of the BSQ was deemed to be satisfactory.

The BSQ was developed to assist in addressing a number of questions about concern with body shape. First, it is not clear how this important aspect of the specific psychopathology of bulimia nervosa relates to other clinical features of the disorder, such as disturbed eating attitudes and behaviour and to disturbances in body size perception, and to the high level of non-specific psychopathological disturbance typically found among these patients (Fairburn and Cooper, 1984a). Second, it is not clear how concern with shape relates to response to treatment and outcome from the eating disorder, and whether the level of such concern changes following treatment. Third, the significance of concern with shape among women in the community is not known, nor whether factors related to concern with shape among patients with bulimia nervosa are similarly related among women in general. It needs to be ascertained whether basic demographic variables such as age, weight and weight history are related to concern with shape, whether the sexes differ in the level of such concern, whether general mental state is related, and whether the level of such concern varies across time, such as with phase of the menstrual cycle. Subsequent chapters will explore these questions.

Chapter 3

Concern With Shape Among Women In The Community

Section 1

Relationships between concern with shape, demographic factors, weight history and eating behaviour

Introduction

There have been many suggestions that a slim body shape is important to most women (eg. Rodin et al,1984), and that *feeling fat* appears to be the norm (Wooley and Wooley,1984), as was reviewed in Chapter 1. Dissatisfaction with body shape is common, and it has been suggested that such dissatisfaction may be associated with a young age and a high body weight (Berscheid et al,1973), dieting (Dwyer et al,1967; Nylander,1971; Dent,1981), and disturbed eating behaviour (Dent,1981; Striegel-Moore et al,1986), particularly with bingeing and purging (Cash et al,1986) which are characteristic of the eating disorder bulimia nervosa. Although marked body shape disparagement appears to be quite rare, such extreme concern with shape has been associated with a history of a very high weight (Stunkard and Burt,1961; Stunkard and Mendelson, 1961,1967; Stunkard,1976).

While concern with shape appears to be prominent among women, there is very little empirical evidence to support this view, probably because there has been no satisfactory measure of such concern. The published reports on concern with shape are limited in that they provided no supportive data (eg. Stunkard and Mendelson,1961,1967), or were based on dissatisfaction with body parts not specifically associated with shape (eg. Berscheid et al,1973). Although body part dissatisfaction is undoubtedly an important aspect of concern with shape, it forms only one aspect of this concern, as was discussed in Chapter 2.

In Chapter 2 a new measure of concern with shape was reported, and it was found that the majority of women show some concern, ranging from a mild level experienced by many women in the community to a very marked level experienced by most patients with bulimia nervosa. Since concern with shape is so common among women it is important to assess its significance in terms of factors associated with such concern.

The aim of the present study was to examine the significance of concern with shape among women in the community, in terms of its association with age, weight and weight history, and eating behaviour. Based on the suggestions made by other studies described above, it was predicted that a high level of concern with shape would be associated with a young age, a high weight and a history of a high weight, dieting and disturbed eating behaviour.

Method

Subjects

Three groups of women provided the data for this study: 331 consecutive attenders at two family planning clinics, 119 occupational therapy (O.T.) students, and 85 undergraduate students, a total of 535 women from the community. The recruitment of these subjects was described in Chapter 2.

Assessments

The measures taken were as follows:

- (1) The Body Shape Questionnaire or BSQ (see Chapter 2), which measures concern with shape.
- (2) The Eating Attitudes Test or EAT (Garner and Garfinkel, 1979) which measures disturbed eating attitudes and behaviour.
- (3) A demographic schedule of questions on age, height, weight and weight history (Appendix 13).
- (4) An eating schedule of questions on whether the women were currently dieting to control their weight,¹ whether they currently experienced episodes of uncontrollable and excessive overeating, whether they currently induced vomiting to control their weight, and whether they currently used laxatives to control their weight (Appendix 13).

Not all the measures were taken on all the subjects. For logistical reasons truncated versions of the full set of assessments were sometimes used. The information obtained on each group is shown in Table 3.1.1

¹ A diet was defined as distinct rules surrounding eating, intended to either reduce or control weight. Examples of such rules are: eat less in quantity; eat fewer calories; omit specific meals.

Table 3.1.1

Undergraduate Students	O.T. Students	Clinic Attenders
BSQ score	BSQ score	BSQ score
Age	Age	Age
MPMW	MPMW	MPMW
Dieting	Dieting	Dieting
	Desired MPMW	
	Weight Dissatisfaction	
	Highest MPMW	Highest MPMW
	Lowest MPMW	Lowest MPMW
	Previous Anorexia nervosa	Previous Anorexia nervosa
	Overeating	Overeating
	Vomiting	Vomiting
	Laxative abuse	Laxative abuse
	EAT ¹ score	

1 Eating Attitudes Test (Garner and Garfinkel,1979)

Results

Results from the measures for the three samples combined are shown in Table 3.1.2.

Table 3.1.2
Results from the measures

	N	% of sample	Mean	sd	N who completed the assessment
BSQ score			81.5	28.4	535
Age			22.7	5.4	530
MPMW			98.3	11.0	524
Highest MPMW			106.3	13.1	494
Lowest MPMW			91.2	10.9	438
Desired MPMW			91.5	7.3	322
Weight Dissatisfaction ¹					
lb			10.5	11.7	321
%			6.2	6.9	321
History Of Obesity ²	64	13.0			494
Dieting	119	22.5			528
Previous Anorexia nervosa					
Broad ³	14	3.2			438
Narrow ⁴	7	1.6			438
Overeating	98	22.8			430
Vomiting	9	2.0			447
Laxative Abuse	4	0.9			446

1 Current MPMW minus desired MPMW

2 Previous MPMW $\geq 120\%$

3 Lowest MPMW $< 85\%$ plus concurrent amenorrhoea

4 Lowest MPMW $< 75\%$ plus concurrent amenorrhoea

Age

Age was significantly negatively related to the BSQ ($r = -.13$, $P < .001$), indicating that younger women were more concerned with their shape than older women. The undergraduate students were significantly younger than the family planning clinic attenders (20.0, $sd = 1.1$ versus 23.8, $sd = 6.3$; $t = 10.6$, $df = 383.9$, $P < .001$), and scored significantly higher on the BSQ (88.5, $sd = 29.2$ versus 81.0, $sd = 28.4$; $t = 2.15$, $df = 414$, $P < .04$). This difference between groups was attributable to differences in age and not other group differences: controlling for age using analysis of covariance, the undergraduate students scored similarly on the BSQ compared with the clinic attenders (adjusted means = 86.8 versus 81.4 respectively; $F = 2.23$, $df = 1, 410$, $P > .05$).

Thus, women in their late teenage years or early twenties were more concerned with their shape compared with slightly older women.

Current weight

Current body weight was significantly related to the BSQ, a high weight being associated with a high level of concern with shape ($r=.47$, $P<.001$). To examine further this relationship the women were divided into three groups according to weight: those who were underweight (ie. $MPMW^2 < 85\%$), those who were of average weight (ie. $MPMW=85-115\%$) and those who were overweight (ie. $MPMW > 115\%$). Table 3.1.3 shows that using a one-way analysis of variance, BSQ scores significantly increased with each category of weight.

Table 3.1.3
The relationship between concern with shape and weight

	MPMW			F	df	P
	< 85 (N=461)	85-115 (N=443)	> 115 (N=46)			
BSQ ¹	59.6	81.8	100.4	26.0	2,532	.001
sd	21.4	27.7	27.6			

1 All groups significantly different ($P<.05$: Scheffe's multiple range test)

Thus, a high level of concern with shape was associated with a high body weight.

Desired weight

A high score on the BSQ was associated with a high desired weight³ ($r=.21$, $P<.001$). However, women who showed a high desired weight also had a high current weight ($r=.83$, $P<.001$); and the relationship between a high BSQ score and a high desired weight was mediated by current weight. Using a partial correlation to control for the relationship between current weight and BSQ score, a low desired weight was significantly associated with a high BSQ score ($r=-.45$, $P<.001$).

Thus, allowing for current weight, a low desired weight was associated with a high level of concern with shape.

² Weight in pounds expressed as a percentage of average weight, matched for age, height and sex (Geigy,1962).

³ Desired weight in pounds expressed as a percentage of average weight, matched for age, height and sex (Geigy,1962).

Weight dissatisfaction

Weight dissatisfaction (ie. current MPMW minus desired MPMW) was significantly related to the BSQ ($r=.65$, $P<.001$). It was not possible to examine the independence of this relationship controlling for current weight, since weight dissatisfaction was in part derived from current weight.

Thus, a high degree of dissatisfaction with weight was associated with a high level of concern with shape. This relationship was stronger than the relationship between weight *per se* and concern with shape reported above.

Highest body weight

The relationship between a history of a high body weight and score on the BSQ was examined in two ways. First, the womens' highest reported weight was found to be significantly associated with a high score on the BSQ ($r=.43$, $P<.001$). Even though current weight was significantly related to highest weight ($r=.85$, $P<.001$), the relationship between the BSQ and highest weight was independent of current weight (Partial $r=.09$, $P<.03$), although allowing for current weight the association was small. Second, Table 3.1.4 shows that women with a history of obesity⁴ (ie. previous MPMW $\geq 120\%$) scored significantly higher on the BSQ compared with women with no such history (ie. previous MPMW $< 120\%$). However, Table 3.1.4 also shows that women with a history of obesity had a significantly higher current weight, and the relationship between a history of obesity and a high BSQ score was found to be mediated by current weight. Controlling for the relationship between current weight and score on the BSQ using analysis of covariance, women with a history of obesity scored similarly on the BSQ compared with women with no such history (adjusted means=82.3 versus 77.5 respectively; $F=2.34$, $df=1,521$, $P>.05$).

⁴ Throughout this thesis obesity is defined according to the criterion of Stunkard (1984): a mean body weight of at least 20 percent above average, matched for age, height and sex.

Table 3.1.4
The relationship between a history of obesity and concern with shape

	History of Obesity (N=102) \bar{x}/sd	No History of Obesity (N=433) \bar{x}/sd	F	df	P
BSQ	90.5 30.4	79.4 27.6	12.90	1,533	.001
MPMW	108.4 14.6	96.0 8.4	127.2	1,522	.001

Thus, compared with women who had never been obese, those with a history of obesity showed greater concern with their shape, although this association was not independent of current weight.

Low body weight

A history of a low body weight was examined in relation to the BSQ in two ways. First, lowest reported weight since puberty was found to be associated with a low score on the BSQ ($r=.21$, $P<.001$). However, lowest weight was also significantly related to current weight ($r=.77$, $P<.001$); and controlling for the relationship between current weight and BSQ score, lowest reported weight was associated with a *high* score on the questionnaire ($r=-.20$, $P<.001$). Second, women with and without a history of probable anorexia nervosa were compared on the BSQ. In this study where only self-report information was available, a history of probable anorexia nervosa was defined in two ways:

- (i) A previous weight of less than 75 percent MPMW with concurrent amenorrhoea, ie. *narrow* criteria;
- (ii) A previous weight of less than 85 percent MPMW with concurrent amenorrhoea, ie. *broad* criteria.

Table 3.1.5 compares the BSQ scores of women with a history of probable anorexia nervosa using the narrow criteria (N=7) with those with no such history (N=431). Due to the marked differences in the number of subjects in each group the Mann-Whitney U-test was used to compare these women. Those with a history of probable anorexia nervosa scored significantly higher on the BSQ. The two groups were of similar current weight.

Table 3.1.5
The relationship between a history of probable anorexia nervosa
(narrow criteria) and current concern with shape

	Previous Probable Anorexia Nervosa (N=7)	No History (N=431)	Z	P
BSQ				
\bar{X}	105.0	79.4		
sd	32.2	28.0		
Mean ranks	316.7	217.9	2.05	.04
MPMW				
\bar{X}	91.9	98.1		
sd	13.4	10.9		
Mean ranks	160.4	218.3	1.12	>.05

Table 3.1.6 compares the BSQ scores of women with a history of probable anorexia nervosa using the broad criteria (N=14) with those with no such history (N=424). Although those with a history of probable anorexia nervosa tended to show greater concern with their shape, the difference between the two groups failed to reach statistical significance. Again, the groups were of similar current weight.

Table 3.1.6
The relationship between a history of probable anorexia nervosa
(broad criteria) and current concern with shape

	Previous Probable Anorexia Nervosa (N=14)	No History (N=424)	Z	P
BSQ				
\bar{X}	93.9	79.4		
sd	33.4	28.0		
Mean ranks	271.8	217.8	1.57	>.05
MPMW				
\bar{X}	94.9	98.1		
sd	10.7	11.0		
Mean ranks	193.5	218.2	0.70	>.05

Thus, allowing for current weight, a history of a low weight was associated with a high BSQ score. Compared with women with no history of probable anorexia nervosa, those with a probable history of the disorder showed greater concern with their shape, particularly those who had appeared to suffer from a more serious form of the disorder.

Dieting

Table 3.1.7 shows a comparison between women who were currently dieting and women who were not dieting. The dieters scored significantly higher on the BSQ. Table 3.1.7 also shows that the dieters weighed significantly more. However, the association between dieting and a high BSQ score was independent of actual weight. Using analysis of covariance to control for the relationship between weight and the BSQ, women who were dieting still scored significantly higher on the BSQ compared with non-dieters (adjusted means=98.4 versus 76.4; $F=73.7$, $df=1,516$, $P<.001$).

Thus, the attempt to lose weight predicted a high level of concern with shape independent of actual weight.

Table 3.1.7
The relationship between dieting and concern with shape

	Dieters (N=119) \bar{X}/sd	Non-Dieters (N=405) \bar{X}/sd	F	df	P
BSQ	104.1 23.1	74.9 26.6	117.4	1,522	.001
MPMW	104.0 10.0	96.6 10.7	45.7	1,517	.001

Eating behaviour

Table 3.1.8 shows that episodes of uncontrollable and excessive overeating, self-induced vomiting and laxative abuse were all significantly related to the BSQ, a frequent occurrence of each being associated with a high level of concern with shape. Table 3.1.8 also shows that these factors were inter-related. Therefore the independence of these relationships with the BSQ was examined using partial correlations. Frequent episodes of uncontrollable and excessive overeating were significantly associated with a high BSQ score independent of vomiting and laxative abuse (Partial $r=.30$, $P<.001$). Frequent vomiting was significantly associated with a high BSQ score independent of episodes of excessive and uncontrollable overeating and laxative abuse (Partial $r=.14$, $P<.01$). Finally, frequent laxative abuse was significantly associated with a high BSQ score independent of episodes of excessive and uncontrollable overeating and vomiting (Partial $r=.12$, $P<.01$).

Thus, excessive and uncontrollable overeating, self-induced vomiting and laxative abuse were significantly and independently associated with a high level of concern with shape.

Table 3.1.8
Relationships between uncontrollable overeating, vomiting
and laxative abuse with the BSQ

	BSQ	Over- Eating	Vomiting
	r / P	r / P	r / P
Overeating	.31 .001		
Vomiting	.20 .001	.10 .02	
Laxative Abuse	.15 .001	.02 >.05	.27 .001

For the 119 O.T. students a high score on the EAT was found to be associated with a high BSQ score ($r=.61$, $P<.001$).

Thus, a high level of concern with shape was associated with disturbed eating attitudes and behaviour.

Predicting concern with shape

Stepwise multiple linear regression analysis⁵ was used to determine which combination of factors produced the best prediction of a high BSQ score. Since not all measures were available for each of the three groups of women, two separate regression analyses were conducted.

In the first analysis data available from the family planning clinic attenders was examined (ie. $N=331$). All factors significantly related to the BSQ ($P<.05$) were entered into the regression equation: namely, age, current weight, desired weight, dissatisfaction with weight, highest weight, lowest weight, history of probable anorexia nervosa, and frequency of episodes of excessive and uncontrollable overeating, vomiting and laxative abuse. Table 3.1.9 shows that a combination of five variables significantly predicted score on the BSQ: namely, marked dissatisfaction with weight, episodes of uncontrollable and excessive overeating, self-induced vomiting, laxative abuse, and a young age.

⁵ With all regression analyses reported in this thesis the goodness of fit of the model was tested in at least two ways. First, observed values of the dependent variable were plotted against predicted values. When there was a marked discrepancy between these values the regression was deemed unsatisfactory. Second, predicted residuals were plotted against observed residuals. Where there was no observable pattern between these the regression model was deemed to produce a satisfactory and unbiased prediction of the dependent variable.

Table 3.1.9
Multiple linear regression analysis: clinic attenders

	Multiple R	F	P
Weight Dissatisfaction	.62	150.7	.001
Frequency of Overeating	.67	96.9	.001
Frequency of Vomiting	.70	76.6	.001
Frequency of Laxative abuse	.71	60.0	.001
Age	.72	49.6	.001

The second regression analysis was based on data available from the O.T. students (N=119). Again, all measures significantly ($P<.05$) related to the BSQ were entered into the equation: namely, age, current weight, highest weight, lowest weight, history of probable anorexia nervosa, score on the EAT, and frequency of overeating, vomiting and laxative abuse. Two variables significantly predicted score on the BSQ: namely, a high score on the EAT and a high current body weight (for score on the EAT Multiple $R=.61$, $F=54.0$, $P<.001$; and for score on the EAT with current weight Multiple $R=.68$, $F=39.1$, $P<.001$).

Thus, for the family planning clinic attenders a high level of concern with shape was predicted by marked weight dissatisfaction, disturbed eating behaviour and a young age. For the O.T. students a high level of concern with shape was predicted by disturbed eating attitudes and behaviour and a high body weight.

Discussion

This study examined relationships between concern with shape and demographic variables, eating behaviour, current weight and weight history among women in the community. A high level of concern with shape was associated with disturbed eating, a high body weight, marked dissatisfaction with weight, a history of both a low weight and a high weight, a history of probable anorexia nervosa, dieting and a young age. It is particularly noteworthy that the desire to lose weight predicted a high level of concern with shape independent of current weight.

Examining the association between a history of probable anorexia nervosa and a high BSQ score, it is possible that women with the disorder may show a high level of concern with their shape and continue to show such concern despite a satisfactory recovery in terms of weight. Alternatively, a high level of concern may arise during weight gain and recovery from the disorder. Clearly, the relationship between concern with shape and outcome from anorexia nervosa needs to be investigated further.

It is not clear at what age concern with shape first emerges since none of the women were under the age of 16. It is also not clear whether older women continue to be concerned with their shape, since most were under the age of 30. The association between age and the BSQ suggests that the level of concern with shape may diminish with increasing age, although a longitudinal study would be needed to establish this. Alternatively, the association may be attributable to a change in the sociocultural pressure to attain and maintain a slim body shape, ie. a period cohort effect, since there is evidence to suggest that the cultural preference for slimness is increasing (Garner et al,1980). The level of concern with shape experienced by girls under the age of 16 and women over the age of 30 needs to be examined.

One limitation of the study was that results from all measures were not available for all three groups of women. Information about desired weight and weight dissatisfaction were available only for family planning clinic attenders; and score on the EAT was available only for O.T. students. Weight dissatisfaction and score on the EAT featured prominently in regression analyses, but it was not possible to examine the inter-relationship between these two variables and their possible additive effects in predicting a high level of concern with shape.

The observed relationships between the BSQ and other factors were associations only. It is not clear whether factors related to the BSQ may influence concern with shape, or whether concern with shape may influence other factors. It is possible that both concern with shape and other factors may reinforce each other in a negative cycle of behavioural and psychological maladjustment. Studies observing change in concern with shape in relation to the temporal position of salient other factors are needed to clarify direction of causality.

Section 2

The relationship between concern with shape and age

Introduction

In Section 1 of this Chapter young women were found to be more concerned with their shape than slightly older women. However, most of the women studied (97%) were under the age of 30, and none was over the age of 52. It is therefore not known whether women over the age of 30 show less concern with their shape compared with women under this age. The association between increasing age and a decreasing level of concern with shape was consistent with a study conducted by the American magazine *Psychology Today* (Cash et al,1986), which reported that dissatisfaction with physical appearance was greater among women in their late teenage years and early twenties than among older women. However, an earlier study conducted by the same magazine (Berscheid et al, 1973), found no difference between different age groups in the level of dissatisfaction with specific body parts.

There has been some interest in the age at which concern with shape first arises among women. As was reviewed in Chapter 1, it has been suggested that dissatisfaction with body shape is widespread by the teenage years (Buvat-Herbaut et al,1983; Clifford,1971; Crisp,1977; Davies and Furnham,1986; Druss and Silverman,1979; Dwyer et al,1967; Guggenheim et al,1977; Huenemann et al,1966; Nylander,1971; Rodin et al,1984; Wardle and Beales,1986), and that *feeling fat* is common among young girls (Crisp,1977; Druss and Silverman,1979; Huenemann et al,1966; Nylander,1971; Wardle and Beales,1986). Among teenage girls such dissatisfaction appears to be focused on fleshy body areas, such as the waist, hips and thighs (Clifford,1971; Davies and Furnham,1986; Guggenheim et al,1977; Huenemann et al, 1966). It has also been suggested that concern with fatness may motivate dieting which is widespread among teenage girls (Crisp,1977; Davies and Furnham,1986; Druss and Silverman,1979; Dwyer et al,1967; Guggenheim et al,1977; Huenemann et al,1966; Nylander,1971; Wardle and Beales,1986), and may evoke feelings of guilt after eating (Wardle and Beales,1986). The prevalence of concern with body shape among teenage girls is unclear. Three studies (Huenemann et al,1966; Nylander,1971; Simmons and Rosenberg,1975) reported that these concerns became increasingly more common across the teenage years, whereas one study (Wardle and Beales,1986) found similarly high levels of concern among girls of 12 and 18. Koff et al (1978) suggested that menarche may be an important event influencing a girl's concern with her body shape. Since menarche is associated with a change in shape and an increase in body fat it is conceivable that concern with shape may increase at this time.

Despite the suggested association between concern with shape and age there is very little satisfactory evidence to support this association aside from the results presented in Section 1 of

this Chapter. The published reports examining concern with shape in relation to age are severely limited in that none used a standardised validated measure specifically designed to assess concern with shape, thereby making findings difficult to interpret. The studies either simply asked respondents whether they *felt fat* (eg. Nylander,1971), or examined perception of sexual attractiveness (eg. Cash et al,1986), or examined dissatisfaction with body parts not specifically associated with body shape (eg. Berscheid et al,1973), or simply asked respondents to rate their shape on a single ordinal scale (eg. Wardle and Beales,1986), or used a measure which is widely considered to be methodologically unsound (eg. the *Draw-A-Person Test*, Koff et al,1978). None of the studies examined the association between age and concern with shape using a satisfactory and validated measure of this concern.

The relationship between concern with shape and age merits further empirical investigation since such concern is maladaptive and has been found to be associated with behavioural and psychological disturbance (see Section 1 of this Chapter). It is therefore important to know the age at which such concern typically arises. The suggestion that girls as young as 12 are highly concerned with their shape (Wardle and Beales,1986) is striking. It is also important to know whether concern with shape diminishes with increasing age.

The aim of the present investigation was to examine further the relationship between concern with shape and age. Two studies were conducted.

Study 1: Concern with shape among schoolgirls

The first study investigated concern with shape among schoolgirls. The aims were:

- (1) To determine at what age concern with shape first arises.
- (2) To determine whether the level of such concern increases during the teenage years.
- (3) To determine whether the onset of puberty is associated with an increase in concern with shape.

Method

Assessments

All girls attending two schools (ie. girls between the ages of 11 and 18) were asked to complete the Body Shape Questionnaire or BSQ (see Chapter 2). The girls were also asked to complete a short background information sheet indicating their age, height, weight, whether they had begun menstruating and the age at which menarche had occurred. Replies were anonymous.

Results

Two hundred and forty-seven girls were asked to complete the assessments. Two hundred and forty-two returned their questionnaires. Four of these were found to be incomplete and were

excluded from data analyses. The final sample of 238 represented a response rate of 96.4 percent.

Concern with shape in relation to age

Table 3.2.1 shows the age, weight and BSQ scores of the girls. Since it was not possible to calculate the MPMW of the girls aged 11 and 12 their body mass index (BMI) is shown (weight in Kg/height in metres squared). Compared with the older girls, the girls aged 11 and 12 showed less concern with their shape, and this difference was significant compared with the girls aged between 15 and 16. The BSQ scores of the girls between the ages of 13 and 18 were not significantly different, although girls aged between 15 and 16 tended to score higher than all the other girls.

Table 3.2.1
Concern with shape in relation to age

	11-12 Years (N=17) \bar{X}/sd	13-14 Years (N=80) \bar{X}/sd	15-16 Years (N=100) \bar{X}/sd	17-18 Years (N=40) \bar{X}/sd	F	df	P
BSQ	66.4 ¹ 27.4	89.4 33.8	101.7 40.6	92.5 31.8	5.23	3,233	.01
BMI	17.3 ² 2.67	20.7 3.22	21.5 2.88	21.0 2.07	10.48	3,230	.001
MPMW	—	100.7 15.6	103.1 13.7	98.8 9.8	1.48	2,214	>.05

1 Significantly different from 15-16 years: Scheffe's Multiple Range test ($P < .05$)

2 Significantly different from all other groups: Scheffe's Multiple Range test ($P < .05$)

Table 3.2.1 shows that the youngest girls had significantly less body fat compared with the older girls. Since the onset of puberty is associated with an increase in fatness it was not considered appropriate to control for the difference in fatness between the youngest and older girls.

Thus, pre-teenage girls showed significantly less concern with their shape compared with older girls, but the level of concern with shape did not significantly increase during the teenage years.*

Concern with shape in relation to puberty

Among the girls aged 11 and 12, 10 had not yet begun menstruating and seven had. In Table 3.2.2 the BSQ scores, weight and age of pre-menarchal and post-menarchal girls are compared.

* In addition to there being no difference in mean BSQ scores between the three age categories, the proportion within each category with 'Marked' concern (ie. BSQ > 140) was also no different ($\chi^2 = 3.96$, $P > .05$).

Since the number of girls in each group was small the Mann-Whitney U-test was used to compare the groups. The two groups were of similar age and weight, but compared with the pre-menarchal girls, those who were post-menarchal scored significantly higher on the BSQ.

Table 3.2.2
Concern with shape in relation to puberty

	Pre-menarch $\bar{X}/sd/\bar{X}$ ranks (N=10)	Post-menarch $\bar{X}/sd/\bar{X}$ ranks (N=7)	Z	P
BSQ	54.1 24.8 6.8	83.9 21.8 12.1	2.15	.03
Age	11.7 0.5 8.0	12.0 0.0 10.5	1.55	>.05
BMI	17.1 3.1 7.50	17.7 2.1 11.14	1.46	>.05

Thus, compared with pre-pubertal girls, girls who had reached puberty showed significantly greater concern with their shape.

Discussion

This study investigated concern with shape among adolescent girls. The response rate to participation in the study was high, although one limitation of the study was that the number of girls aged between 11 and 12 was small, and therefore results from this age group should perhaps be interpreted with caution.

The results suggested that concern with shape may typically arise at around the age of 13, at a time of an increase in body fat. Girls of 11 and 12 were less concerned with their shape compared with girls of 13 and older. However, compared with girls of 13 and 14, concern with shape was no greater among the older girls. This suggests that after concern with shape is first experienced it does not increase uniformly throughout the teenage years but remains at a relatively constant level. This finding is consistent with a recent study of concern with fatness by Wardle and Beales (1986), which also found no increase in concern across the teenage years, although their study did not use a satisfactory validated measure of concern with shape and

simply asked girls to rate their shape on a scale of fatness. The findings of both the current study and that by Wardle and Beales are contrary to several earlier reports (Huenemann et al,1966; Nylander,1971; Simmons and Rosenberg,1975) which suggested that concern with shape was more common among older compared with younger teenage girls, although again these studies did not use validated measures of such concern. It is possible that the discrepant findings between the current study and earlier studies may be attributed to a change in the cultural preference for a slim shape (Garner et al,1980) which may have heightened the level of concern experienced by young girls.

Menarche and the onset of puberty appeared to be an important factor in relation to concern with shape. Pre-pubertal girls showed significantly less concern compared with girls who had reached puberty. The pre-menarchal and post-menarchal girls were of similar age and weight, and therefore different levels of concern with shape may not be attributable to different peer-group pressure or differences in fatness.

To conclude, this study found that pre-pubertal girls showed less concern with their shape compared with older girls, and girls of 13 and 14 showed a similar level of concern with their shape compared with girls of 17 and 18. These findings suggest that concern with shape appears to arise at the time of puberty, and once such concern is experienced it seems to remain at a relatively constant level across the teenage years.

Study 2: Concern with shape among older women

The aim of the second study was to investigate concern with shape among women over the age of 30 to determine whether concern with shape decreases with increasing age.

Procedure

All women (N=42) attending two meetings at two branches of the *Women's Institute* (WI) in Cambridge were asked to complete the BSQ and to indicate their age, height and weight. All replies were anonymous.

The data collected from these women were compared with the data from the three groups of women in the general population reported in Section 1 of this Chapter.

Results

Subjects

All the women returned satisfactorily completed questionnaires. Two were excluded from data analysis: one because she reported a medical thyroid complaint and weighed 152 percent of average weight; and one because she had recently given birth. It was considered inappropriate to examine these women's concern with their body shape.

Only two of the WI women were under the age of 40, and all were over 30. Therefore, there was little overlap in terms of age between this sample and the general population sample reported

in Section 1.

Age and BSQ differences

Table 3.2.3 shows that the WI women were significantly older than the total sample of 535 women in the general population, but scored similarly on the BSQ.

Table 3.2.3
Comparisons between WI women and women in the general population

	WI Women (N=40)	General Population Women (N=535)	t	df	P
Age	56.5	22.7	18.99	39.4	.001
sd	11.0	5.4			
BSQ	78.3	81.5	0.69	573	>.05
sd	26.1	28.4			

The WI women were then compared with the sample of undergraduate students to examine differences in concern with shape between two markedly different age groups. The undergraduate students were all in their late teenage years or early twenties and thus there was no overlap between the two groups in terms of age. Table 3.2.4 shows that the WI women were considerably older and tended to show less concern ($P<.06$).

Table 3.2.4
Comparisons between WI women and undergraduate students

	WI Women (N=40)	Undergraduate Students (N=85)	t	df	P
Age	56.5	20.0	20.6	38.3	.001
sd	11.0	1.1			
BSQ	78.3	88.5	1.88	123	.06
sd	26.1	29.2			

Discussion

The association between age and concern with shape reported in Section 1 of this Chapter and the findings from this study suggest that level of concern with shape is slightly higher among women in their late teens and early twenties compared with older women. However, the relationship between increasing age and decreasing level of concern was not found to be linear since women in their mid twenties showed similar BSQ scores compared with women who were considerably older; and women who were much older scored nearly as high as younger women on the BSQ.

From the data presented it is not possible to say whether concern with shape decreases with increasing age. Compared with the older women, the higher level of concern with shape shown by the younger women may reflect a change in cultural pressures influencing concern with shape ie. a period cohort effect, as was suggested in Section 1 of this Chapter. It has been reported that the cultural preference for slimness has recently increased, as mentioned above, (Garner et al,1980), which suggests that cultural factors may account for the higher level of concern with shape shown by the younger women.

Section 3

Concern with shape among women concerned with their weight

Introduction

In Section 1 of this Chapter a high level of concern with shape was found to be associated with a high body weight and a history of obesity. These associations were consistent with reports by Stunkard and his colleagues (Stunkard and Mendelson,1961,1967; Stunkard and Burt,1976; Stunkard,1976; Rand and Stunkard,1978) based on severely overweight people, some of whom were found to show an extreme level of concern with their shape and experience intense disparaging feelings towards their appearance. In this series of studies on the obese, such disturbances were found only among those obese since childhood, and Stunkard and his colleagues concluded that disparaging feelings towards body shape may first emerge among the obese during adolescence. Among the obese who showed extreme concern with their shape, the degree of overweight was unrelated to the level of concern, and weight loss was not found to necessarily alleviate the extreme level of concern. However, despite the very detailed and informative observations by Stunkard and his colleagues, their reports on body shape disparagement in the overweight are limited. Their findings were based on severely overweight patients, and it is not clear whether less severely overweight people in the general population show similarly extreme levels of concern with their body shape. Some of their patients were being treated for neurotic problems aside from their weight, and it is possible that overweight people who are emotionally healthy may show little concern with their shape. Perhaps the greatest limitation is that their reports were based on clinical observation. There has been no empirical research into concern with shape among people who are overweight using satisfactory standardised measures.

Dieting is often associated with a high body weight (eg. Stunkard,1976) and a history of a high weight (Bruch,1973). In Section 1 of this Chapter women who were dieting were also found to be highly concerned with their shape. One limitation of this finding was that dieting was measured by a single question, and the women were simply classified into *dieters* and *non-dieters* based on their responses to this question. It is possible that a high level of dietary restraint may be associated with a high level of such concern.

The aims of the present study were to investigate further relationships between concern with shape, current weight, dieting, and weight and dietary history. The research was conducted on women who were particularly concerned with their weight, ie. attenders at the commercial slimming organisation *Weight Watchers*. Women are allowed to become members of *Weight Watchers* only if they are currently overweight or have been in the past. Weight is an important issue for all members. Although not all *Weight Watchers* consider themselves to be *dieting*, each

follows a strict eating programme with distinct dietary rules, and therefore all may be regarded to be dieters. Each Weight Watcher is assigned a *goal weight* to achieve and maintain, which is usually within the average weight range. The organisation provides financial and social rewards and punishments for changes in weight.

Three predictions were made:

- (1) Weight Watchers would show a higher level of concern with their shape than women in the general population;
- (2) Among Weight Watchers, level of dietary restraint and a history of dieting would be associated with a high level of concern with shape;
- (3) Negative feelings towards body shape during adolescence would be associated with a high level of concern with shape during adulthood.

Subjects

Weight Watchers

Women attending seven meetings at one branch of *Weight Watchers* in September and October 1986 were asked to participate in a study of *Dieters and Dieting*. These months were chosen because the organisation holds national recruitment campaigns at this time. The weekly *Weight Watchers* meetings consisted of weighing members followed by a lecture. Not all members stayed for the lecture. Members who left before the lecture were given a letter asking them to participate in the study; and those who stayed were verbally asked to participate.

Women in the community

The Weight Watchers were compared with the sample of 535 women in the community described in Section 1 of this Chapter.

Procedure

The Weight Watchers were interviewed in their homes using standardised questions about their weight and dietary history, and about concerns with their body shape during puberty (Appendix 14). The women were then weighed and completed four self-report questionnaires:

- (i) The Body Shape Questionnaire or BSQ (see Chapter 2), which measures concern with shape;
- (ii) The Beck Depression Inventory or BDI (Beck et al, 1961), which is a 21-item questionnaire measuring level of depression. A high score indicates marked depression;
- (iii) The Rosenberg Self-Esteem Scale (Rosenberg, 1965), which is a 10-item questionnaire measuring self-esteem. A low score indicates a low evaluation of self-worth;

- (iv) The *Dietary Restraint* factor of the Three Factor Eating Questionnaire (Stunkard and Messick,1985). This factor consists of 20 questions which are concerned with cognitive control of food intake. A high score on this factor indicates a high level of dietary restraint.

Results

Weight Watchers

All the Weight Watchers were female. Nineteen members did not stay for the weekly lectures and were handed a letter asking them to participate. Four returned the reply form and were interviewed. Of the 61 members who were verbally asked to participate, 18 refused; 43 agreed to be involved in the study but 10 of these could not be contacted or were not available to be interviewed. A total of 37 women were included in the study. Information on these women is given in Table 3.3.1.

Table 3.3.1
Information on the Weight Watchers

	Mean	sd	Range
BSQ	104.7	29.1	54 - 176
Age	34.4	9.1	14 - 49
MPMW	116.1	17.6	89 - 166
Highest MPMW	132.1	20.0	97 - 184
Average Weight Loss ¹	11.8	10.1	-9 - 43
EAT	16.4	10.7	3 - 49
Dietary Restraint	13.1	3.9	1 - 20

1 Weight loss in pounds since joining *Weight Watchers* (\bar{x} duration=10.5 months, sd=22.0, range=0-96 months)

Prediction 1

Current body weight

Compared with the sample of women in the community, the Weight Watchers weighed more and scored higher on the BSQ, as shown in Table 3.3.2.

Table 3.3.2
Weight and BSQ scores of Weight Watchers and
Women in the community

	Weight Watchers (N=37)	Women in the Community (N=535)	t	df	P
MPMW	116.1	98.3	6.08	38.0	.001
sd	17.6	11.0			
BSQ	104.7	81.5	4.80	570	.001
sd	29.1	28.4			

Thus, prediction 1 was supported in that Weight Watchers showed greater concern with their shape compared with women in the community. The relationship between weight and concern with shape was explored further. Among the Weight Watchers a high current body weight was significantly associated with a high BSQ score ($r=.55$, $P<.001$), which replicated the association between weight and concern with shape among women in the community reported in Section 1 of this Chapter.

Five of the Weight Watchers were maintaining their goal weight; and although this group was too small to allow statistical analysis, their average BSQ score of 87.4 ($sd=15.0$) was considerably lower than the average score of 107.4 ($sd=30.0$) for the remainder of the group. Twelve of the Weight Watchers had reduced their weight to within 10 percent of average weight, and were compared on the BSQ with those who were currently above 10 percent of average weight and with women in the community. Table 3.3.3 shows that using a one-way analysis of variance, Weight Watchers who weighed within the normal range scored similarly on the BSQ compared with women in the community ($P>.05$); but did not score significantly lower compared with Weight Watchers who were overweight. Although Cochran's assumption of equal variance was satisfied (Cochran's $C=.36$, $P>.05$), due to the marked differences in sample size, these three groups were also compared using a Kruskal-Wallis non-parametric analysis of variance. Again, Weight Watchers who weighed within the normal weight range scored mid-way between overweight Weight Watchers and women in the community, as shown in Table 3.3.3.

Table 3.3.3
Normal weight Weight Watchers compared with overweight
Weight watchers and women in the community

	Overweight Weight Watchers (N=25)	Normal Weight Weight Watchers (N=12)	Women in the Community (N=535)			
BSQ	110.1 ¹ 29.3	93.6 26.4	81.5 28.4	F=12.9	df=2,569	P<.001
Mean Ranks	430	354	278	$\chi^2=22.3$		P<.001

1 Significantly different from women in the community (P<.05): Scheffe's multiple range test

Thus, among the Weight Watchers a high body weight was associated with a high level of concern with shape.

Highest weight

Highest reported body weight was significantly related to the BSQ ($r=.57$, $P<.001$); and this association was independent of current weight (Partial $r=.30$, $P<.04$).

Thus, a history of a high weight was associated with a high level of concern with shape.

Weight loss

It was possible that among the group of Weight Watchers who were above their goal weight, those who had nevertheless lost a considerable amount of weight would show less concern with their shape compared with women who had achieved little weight loss. The relationship between concern with shape and weight loss among women not at their goal weight (N=32) was examined in two ways. First, amount of weight lost (in pounds) since joining Weight Watchers was correlated with the BSQ: there was no significant relationship ($r=.18$, $P>.05$). Second, the average amount of weight lost by the overweight Weight Watchers since joining the organisation was 10.3 pounds: using a median split, women who had lost a lot of weight (ie. \bar{X} weight loss=16.7lb, $sd=9.3$) scored similarly on the BSQ compared with women who had lost little weight (ie. \bar{X} weight loss=3.9lb, $sd=4.2$) (BSQ=108.4, $sd=27.0$ versus 106.4, $sd=33.5$ respectively; $t=0.19$, $df=30$, $P>.05$).

Thus, weight loss was unrelated to level of concern with shape. At first inspection this finding is apparently contrary to finding that normal weight Weight Watchers scored similarly to women

in the community on the BSQ, since the latter suggests that Weight Watchers who had successfully reduced their weight to within the average range also showed an average BSQ score. However, Table 3.3.4 shows that the normal weight Weight Watchers had never been as overweight as the overweight Weight Watchers, and had not lost significantly more weight.

Table 3.3.4
Weight history of Weight Watchers

	Normal Weight Weight Watchers (N=12)	Overweight Weight Watchers (N=25)	t	df	P
% Highest Weight	119.6 17.7	138.2 18.4	2.90	35	.01
Weight (lb) at Joining Weight Watchers	155.2 15.2	175.3 24.9	2.57	35	.02
Weight Loss (lb)	14.8 9.7	10.3 10.2	1.26	35	>.05

Thus, weight loss was unrelated to concern with shape.

Dissatisfaction with weight

Dissatisfaction with weight (ie. desired MPMW subtracted from current MPMW) was highly related to the BSQ ($r=.61$, $P<.001$). It was not possible to examine this relationship controlling for current weight since the measure of weight dissatisfaction was in part derived from current weight.

Thus, a high level of dissatisfaction with weight was associated with a high level of concern with shape; and this association was stronger than the association between concern with shape and weight *per se*. This finding was similar to that reported in Section 1 of this Chapter for women in the community.

Prediction 2: Dieting

There was no relationship between dietary restraint score and score on the BSQ ($r=.16$, $P>.05$). Thus, prediction 2 was unsupported in that a high level of dietary restraint was not associated with a high level of concern with shape. However, most of the Weight Watchers were highly restrained eaters, and it is possible that there was insufficient variability in dietary restraint scores for there to be a relationship between restraint and concern with shape.

Concern with shape was then examined in relation to dietary history. Table 3.3.5 compares Weight Watchers who had dieted before puberty with those who first dieted as adults. Four of the Weight Watchers had dieted before puberty, and all scored highly on the BSQ. However, they also showed a high current body weight, and it is possible that the association between childhood dieting and a high BSQ score as an adult may have been mediated by current weight. Too few women had dieted during childhood to allow statistical analyses.

Table 3.3.5
Comparison between Weight Watchers who first dieted
During or after childhood

	Dieted Before Puberty (N=4)	First Dieted After Puberty (N=33)
BSQ	135.0	101.1
sd	22.9	27.8
MPMW	140.9	113.1
sd	22.1	14.6

Thus, childhood dieting appeared to be associated with a high level of concern with shape during adulthood, although this suggestion must be regarded as tentative.

Prediction 3: Concern with body shape at puberty

Attitudes towards body shape at puberty were examined in relation to the BSQ in two ways:

- (i) Weight Watchers who recalled being upset by *puppyfat* at puberty were compared with those who had no such recollection. BSQ scores were not significantly different between the two groups (BSQ=112.2, sd=16.0, N=11 versus BSQ=102.9, sd=33.9, N=23 respectively; $t=1.08$, $df=32$, $P>.05$).
- (ii) Weight Watchers were classified into those who recalled being distressed by the development of their hips and breasts at the time of puberty (N=7), and those who were pleased or indifferent about such changes (N=28). Due to the small number of subjects in the distressed group, a Kruskal-Wallis non-parametric analysis of variance was used to compare these women. Again, BSQ scores for the two groups were not significantly different (mean ranks for the unconcerned group=17.0, and for the distressed group=22.1; $\chi^2=1.43$, $P>.05$).

Thus, prediction 3 was unsupported in that among the Weight Watchers, a high level of concern with body shape during adulthood was not associated with a high level of concern with shape during childhood or adolescence.

Discussion

This study investigated further the relationship between concern with shape, weight and dieting. The study had a number of limitations. Few of the women reported childhood obesity and dieting, and the response rate to participation in the study was low. The latter was largely due to women not replying to the recruitment letter, since willingness to participate was high among weight watchers who attended the weekly lecture.

Among women sufficiently concerned with their weight to be attending a commercial weight reducing programme, a high body weight was associated with a high level of concern with shape. Overweight Weight Watchers scored significantly higher on the BSQ compared with women in the general population, whereas normal weight Weight Watchers did not differ on the BSQ from women in the general population. Findings were consistent with the relationship between weight and concern with shape reported in Section 1 of this Chapter. However, these associations were contrary to the observations of Stunkard (1976), discussed above, that disparaging feelings towards body shape were independent of degree of overweight among the obese. The discrepancy may be due to differences between the populations studied. Stunkard's (1976) report was based on severely overweight patients, whereas most of the Weight Watchers in the current study were not markedly overweight. A threshold effect may exist whereby once a very high weight is exceeded factors aside from weight may influence the level of concern with shape.

Among the Weight Watchers a high level of concern with shape was associated with a high level of dissatisfaction with weight, which was consistent with a similar association observed among women in the community reported in Section 1 of this Chapter. Also in the present study, a high level of concern with shape was associated with a history of being markedly overweight, independent of current weight; and level of concern with shape was unrelated to weight loss. Both findings suggest that a high body weight has an enduring effect on level of concern with shape and that weight loss is insufficient to reduce this concern, although a longitudinal study is needed to confirm this. These findings are consistent with the observations of Stunkard and his colleagues (Stunkard and Burt, 1967; Stunkard and Mendelson, 1961, 1967; Stunkard, 1976) who found that weight loss alone did not alleviate extreme concern with body shape.

Contrary to prediction, degree of dietary restraint was unrelated to concern with shape. However, nearly all Weight Watchers are highly restrained eaters since all follow a *programme of eating* consisting of strict dietary rules, as mentioned above. Consequently, there was little variability on the measure of dietary restraint which may explain its lack of association with the BSQ.

Childhood dieting appeared to be associated with a high BSQ score during adulthood, although this suggestion must be regarded as tentative since very few of the Weight Watchers had dieted as children. The association may have been spurious since obese children usually become obese adults (Stunkard and Burt, 1967). Nevertheless, the relationship between childhood dieting and adult concern with shape was consistent with the observation by Stunkard and Mendelson (1961,1967) that body shape disparagement during adulthood is associated with childhood onset obesity.

The prediction concerning an association between negative feelings towards body shape during adolescence and a high level of concern with shape during adulthood was unsupported. This was contrary to the observations of Stunkard and Mendelson (1961,1967) who found that among markedly obese patients, marked body shape disparagement during adulthood was associated with derogatory feelings towards body shape during adolescence. However, most of the Weight Watchers were not severely overweight and it may be that only among severely obese people does an association exist between disparaging feelings towards body shape during adolescence and adulthood.

Thus, overweight women attending a commercial dieting organisation were found to be highly concerned with their shape. Level of dietary restraint was unrelated to the level of concern with shape; and a high level of concern with shape during adulthood was not associated with memories of concern with shape during adolescence. The principal finding from this study was that, as in Section 1 of this Chapter, weight unexpectedly predicted concern with shape.

Section 4

Sex differences in concern with shape

Introduction

In Chapter 2 it was found that the majority of a sample of young women showed some concern with their shape and few showed no concern. It is unclear how specific this concern is to women. Although it has frequently been claimed that the sexes differ markedly in the degree of dissatisfaction with body shape (eg. Huenemann et al,1966; Garner et al,1983), and that *feeling fat* and worry about appearance are more common among women (Rodin et al,1984), there is little empirical evidence to support these contentions. Indeed, only one study (Garner et al,1983) used a standardised validated measure of concern with shape (ie. the *Body Dissatisfaction* subscale of the Eating Disorder Inventory, as was described in Chapter 2), and reported that a sample of men were less dissatisfied with parts of their body compared with a group of normal young women. The study was limited in that this finding was presented as a part of the validation of the measure and therefore no details were given about the men; and the study did not examine other aspects of concern with shape aside from dissatisfaction.

The general aim of this study was to examine concern with shape among men. There were two specific aims:

- (1) To compare the level of concern with shape shown by men with the level shown by women in the community. It was predicted that men would show less concern;
- (2) To examine among men relationships between a relatively high level of concern with shape and other factors, in particular the factors found to be associated with a high level of concern among women in the community, described in Section 1 of this Chapter: namely, a young age, a high body weight, a history of a high weight, dieting and disturbed eating behaviour.

Procedure

Fifty-five men, the total number attending a vocational course for graduate research students were asked to complete the Body Shape Questionnaire or BSQ (see Chapter 2). The questionnaire was slightly amended, with the word *men* substituted for *women*. The men were also asked to complete questions about age, height, weight and past weight, whether they currently experienced episodes of uncontrollable and excessive overeating, whether they currently induced vomiting to control their weight, and whether they currently used laxatives to control their weight (Appendix 15). All replies were anonymous.

The men were compared with the sample of 535 women in the community described in Chapter 2.

Results

Sex differences in BSQ scores

Forty-two men returned completed questionnaires, a response rate of 76.4 percent. Table 3.4.1 shows comparisons between the men and the sample of women in the community. The mean score of the men on the BSQ was 48.3, which was markedly lower than the mean score of 81.5 for the women in the community. Indeed, only one male scored slightly above the mean for the women, scoring 85 on the questionnaire.

Table 3.4.1
Comparisons between men and women in the community

	Men (N=42)	Women (N=535)	t	df	P
BSQ	48.3	81.5	14.2	77.4	.001
sd	12.9	28.4			
Age	25.4	22.7	4.14	53.9	.001
sd	4.0	5.4			
MPMW	94.9	98.3	2.48	52.9	.02
sd	8.4	11.0			

Thus, the men were found to show considerably less concern with their shape than women in the community. Indeed, most showed *No Concern*, (ie. a score below 80, see Chapter 2). However, the men were slightly older and weighed less than the total sample of women in the community. Since, among the women a low BSQ score was associated with a low weight and older age (Section 1 of this Chapter), it was possible that differences in scores on the BSQ between the sexes may have been attributable to differences in age and weight. Therefore, women were selected if they were similar to the men in terms of age and weight (ie. within one standard deviation of the mean of the men on both these factors). This produced a sub-sample of 105 women. Table 3.4.2 shows that compared with this subgroup of women, the men still scored significantly lower on the BSQ, although the two groups were of similar age and weight.

Table 3.4.2
Comparison between men and matched women

	Men (N=42)	Women (N=105)	t	df	P
BSQ	48.3	72.2	7.69	134.2	.05
sd	12.9	24.4			
Age	25.4	24.7	1.04	53.2	>.05
sd	4.0	2.4			
MPMW	94.9	95.3	0.30	49.6	>.05
sd	8.4	4.2			

Thus, allowing for differences in age and weight, the men still showed considerably less concern with their shape than the women in the community.

Relationships between concern with shape and other factors

Among the group of men, score on the BSQ was examined in relation to age, weight and weight history, dieting, bingeing, vomiting and laxative abuse.

A relatively high level of concern with shape was associated with older age ($r=.26$, $P<.05$), and with a high body weight ($r=.26$, $P<.05$). Score on the BSQ was also significantly associated with highest reported body weight ($r=.50$, $P<.001$), and this relationship was independent of current weight (Partial $r=.49$, $P<.001$). Only three men reported a history of obesity, (previous MPMW $\geq 120\%$) and all three had relatively high BSQ scores (BSQ=63,69,85). Only two of the men were currently dieting, and they showed high scores compared with the other men (BSQ=75,85). Eight men reported dieting in the past and were compared with the remainder on the BSQ. Using the Mann-Whitney U-test, previous dieters showed significantly greater concern with their shape (mean ranks=33.4 versus 18.7 respectively; $Z=3.05$, $P<.002$). One male reported recent episodes of uncontrollable and excessive overeating, and showed a relatively high score of 70 on the BSQ. Two others had experienced episodes of uncontrollable overeating in the past, and similarly scored relatively highly on the BSQ (BSQ=75,78). Since none of the men vomited or abused laxatives it was not possible to examine scores on the questionnaire in relation to these variables. Scores on the BSQ were unrelated to height, desired weight and lowest reported weight since adulthood ($P>.05$).

Thus, among the men, a relatively high level of concern with shape was associated with older age, a high body weight, a history of a high weight, dieting and excessive and uncontrollable overeating.

Discussion

This study examined concern with shape among men and compared the level of concern shown by men with the level shown by women in the community. Two methodological considerations are relevant to this study. First, the questionnaire response rate for the men was quite low but was probably sufficiently satisfactory to conduct data analyses. The graduate school attended by the men was very intensive and it is likely that those who failed to respond to the questionnaire simply did not find sufficient time. Second, the sample of men were statistically below the mean in terms of weight. This was unexpected, and it may be that the population statistical averages used to calculate relative weight (ie. Geigy, 1962) may be out of date or inappropriate for use with British samples of men.

It was found that few of the men were concerned with their shape, and that as a group they scored considerably lower on the BSQ than women in the community. Clearly, the men showed very few of the concerns with body shape measured by the questionnaire. After completing the questionnaire a number of respondents verbally reported that they were much more concerned with their height and how muscular their body was, as was also found by Wardle and Beales (1986); and any concerns the men had about fatness were verbally reported to be associated with health and not appearance, in contrast with many women.

Among factors found to be related to the BSQ, all but one (ie. age) were consistent with factors associated with a high score among women in the community (reported in Section 1 of this Chapter). Thus, a relatively high BSQ score among the men was associated with a current and previous high weight, dieting for weight loss, and episodes of uncontrollable and excessive overeating, although the latter finding must be interpreted with caution due to the few men who reported experiencing such episodes. The relationship between higher concern and increasing age was contrary to the association between higher concern and younger age for the women. It is possible that young women show a high level of concern due to sociocultural pressures to be slim, whereas men may develop greater concern as they age due to weight gain or loss of fitness. However, this speculation is based on cross-sectional data and longitudinal studies would be needed to verify this.

To conclude, compared with women, men were found to show considerably less concern with their shape, and this was true even when the men and women were matched for age and weight.

Section 5

The relationship between concern with shape and mental state

Introduction

There have been preliminary suggestions that a high level of concern with shape may be associated with depressed mood. Beck (1973) claimed that depression is commonly accompanied by a high level of concern with fatness, particularly among women, although he provided no empirical evidence to support this claim. Four studies (Goldberg and Folkins, 1974; Berscheid et al, 1973; Marsella et al, 1981; Noles et al, 1985) reported that, compared with women who were satisfied with their appearance, those who were dissatisfied were also more depressed. It is conceivable that feeling miserable may make a woman appear visually unattractive to other people. It is also conceivable that, compared with women who are satisfied with their appearance, those who feel miserable about their appearance may be less attractive. However, the suggested relationship between depressed mood and body dissatisfaction does not appear to be mediated by visual attractiveness since one study (Noles et al, 1985) asked objective raters to rate the appearance of depressed and non-depressed subjects. Compared with those who were not depressed, those who were depressed rated themselves as less attractive, but depressed and non-depressed subjects were rated as being of similar attractiveness.

Despite the reported association between concern with shape and low mood, the studies cited were limited by the measures used to assess concern with shape. Only one (Noles et al, 1985) used a standardised validated measure (ie. the Body Self Relations Questionnaire; Winstead and Cash, 1984), and this measure mainly assesses perception of sexual attractiveness. The three other studies (Goldberg and Folkins, 1974; Berscheid et al, 1973; Marsella et al, 1981) were concerned with body dissatisfaction not specifically associated with body shape, and did not examine relationships between depressed mood and aspects of concern with shape aside from dissatisfaction (as was discussed in Chapter 2). Thus, although there is some preliminary evidence to suggest that concern with shape may be associated with depressed mood, no firm conclusions may be drawn since inadequate measures of concern with shape have been used.

The suggested association between concern with shape and depressed mood is consistent with ideas in Beck's cognitive model of depression, as was outlined in Chapter 1. Beck (1973) observed that the distorted thinking which characterises depression commonly extends to concern about physical appearance, particularly among women. Beck stated that a depressed patient often becomes preoccupied with the thought of getting fat, and may even believe that they have grown fat. However, not all who are depressed are highly concerned with their shape. It is therefore possible that depressed mood may exacerbate concern with shape only when shape is important. It has been suggested that body shape is important to most women (Rodin et al, 1984), although

clearly the level of this importance varies between women.

If the suggested association between concern with shape and depressed mood is supported it is relevant to examine whether a generally poor mental state is associated with a similar high level of concern. Three studies have reported an association between dissatisfaction with specific body parts and low self-esteem (Secord and Jourard,1953; Berscheid et al,1973; Lerner et al,1976); and two studies have reported an association between dissatisfaction with specific body parts and anxiety (Johnson,1956; Goldberg and Folkins,1974). However, again, the findings from these studies are limited because they were based on inadequate measures of concern with shape. Unvalidated measures were used (eg. Johnson,1956; Berscheid et al,1973; Lerner et al,1976), or the studies measured dissatisfaction with body parts not specifically associated with shape and did not examine aspects of concern with shape aside from dissatisfaction (eg. Secord and Jourard,1953; Goldberg and Folkins,1974).

The general aim of the present study was to investigate further the relationship between concern with shape and mental state. The specific aims were:

- (1) To examine the relationship between concern with shape and mood. It was predicted that a high level of concern with shape would be associated with depressed mood;
- (2) To examine the relationship between concern with shape and depressed mood among women for whom body shape is particularly important. It was predicted that the relationship between depressed mood and concern with shape would be greater among these women than among women in general;
- (3) To evaluate possible relationships between concern with shape and general mental state.

Method

Subjects

Three groups of women provided the data for this study:

- (i) 85 female undergraduate students, described in Chapter 2;
- (ii) 59 student nurses, the total number in four training classes, were asked to participate in a study of *young womens' eating habits and attitudes towards weight*. 52 agreed. Information on these women is presented in Table 3.5.1;
- (iii) 37 women who were particularly concerned about their weight ie. *Weight Watchers*. These women showed a higher than average level of concern with their shape, and are described in Section 3 of this Chapter.

Table 3.5.1
Information on student nurses

	Mean	sd	Range
Age	19.1	1.9	18 - 27
MPMW	99.6	11.3	84 - 133
BSQ Score	69.0	22.3	35 - 129

Assessments

The measures taken were as follows:

- (1) A schedule of questions about age, height and weight;
- (2) The Body Shape Questionnaire or BSQ (see Chapter 2);
- (3) The Beck Depression Inventory or BDI (Beck et al,1961) (see Section 3 of this Chapter);
- (4) The Rosenberg Self-Esteem Scale (Rosenberg,1965) (see Section 3 of this Chapter);
- (5) A simple four-point scale measuring the importance of a slim body shape (Appendix 7);
- (6) The Symptom Check List-90 or SCL-90 (Derogatis et al,1973), which is a 90-item questionnaire measuring symptoms typically found among psychiatric outpatients. The measure has nine subscales:
 - (i) *Somatization*, which measures distress arising from perceptions of bodily dysfunction, eg. gastrointestinal, paraesthesia, aches and pains;
 - (ii) *Obsessive-Compulsive*, which measures thoughts, impulses and actions experienced as unremitting and irresistible which are ego-alien;
 - (iii) *Interpersonal Sensitivity*, which measures feelings of personal inadequacy, inferiority, self-deprecation and acute self-consciousness;
 - (iv) *Depression*, which measures dysphoric mood;
 - (v) *Anxiety*, which measures symptoms associated with high manifest anxiety;
 - (vi) *Hostility*, which measures hostile thoughts, feelings and actions, eg. feelings of annoyance, frequent arguments, temper outbursts;

- (vii) *Phobic Anxiety*, which measures symptoms associated with phobic anxiety states, eg. phobic fears including social phobic behaviour;
- (viii) *Paranoid Ideation*, which measures paranoid thinking, eg. suspiciousness, centrality;
- (ix) *Psychoticism*, which measures psychotic symptoms, eg. external thought control, feeling isolated, feeling that one should be punished, and feeling that something is wrong with ones body or mind.

A global index, the *Global Severity Index* or GSI is derived from the mean of all questions. High scores on all subscales indicate a high level of psychiatric disturbance.

For logistical reasons not all the measures were taken on all subjects. The information obtained on each group is shown in Table 3.5.2.

Table 3.5.2
Information obtained on the three groups of women

Students (N=85)	Weight Watchers (N=37)	Nurses (N=52)
BSQ	BSQ	BSQ
Age	Age	Age
MPMW	MPMW	MPMW
BDI	BDI	BDI
Self-Esteem	Self-Esteem	Self-Esteem
Importance of Slim shape		SCL-90

Results

Prediction 1 : Depressed mood and the BSQ

The prediction that depressed mood would be significantly associated with a high BSQ score was supported (for the 52 nurses $r=.38$, $P<.001$; and for the 85 students $r=.43$, $P<.001$).

Prediction 2 : Depressed mood, the BSQ and high importance placed on shape

Prediction 2 was tested in two ways:

- (i) By examining the relationship between depressed mood and the BSQ among the Weight Watchers;

- (ii) By selecting a subgroup of students who considered a slim body shape to be highly important. Seventy students rated slimness as *Moderately* or *Markedly* important.

Prediction 2 was unsupported. Although depressed mood was significantly related to the BSQ for the 37 Weight Watchers ($r=.39$, $P<.001$) and for the subgroup of 70 students ($r=.45$, $P<.001$), these relationships were no greater than those for the nurses and for the total sample of students, as reported above.

Thus, these findings suggest that although a high level of concern with shape is associated with depressed mood among women in general, the strength of the relationship is similar between women who place different importance on a slim shape.

Prediction 3 : General mental state and the BSQ

For the undergraduate students and nurses score on the BSQ was associated with low self-esteem (for the students $r=-.50$, $P<.001$; and for the nurses $r=-.23$, $P<.05$).

For the nurses score on the BSQ was examined in relation to the ten subscales of the SCL-90. Only the *Obsessive-Compulsive* subscale was significantly related, as shown in Table 3.5.3.

Table 3.5.3
Relationships between mental state and concern with shape

	r	P
Somatization	.12	>.05
Obsessive-Compulsive	.39	.01
Interpersonal Sensitivity	.14	>.05
Depression	.14	>.05
Anxiety	.20	>.05
Hostility	.02	>.05
Phobic Anxiety	.16	>.05
Paranoid Ideation	-.03	>.05
Psychoticism	.02	>.05
Global Severity Index	.18	>.05

Since level of depression as measured by the BDI, low self-esteem and the Obsessive-Compulsive subscale of the SCL-90 were all significantly related to the BSQ, stepwise multiple linear regression analysis was conducted to examine whether a combination of factors produced a greater prediction of BSQ scores compared with individual factors alone. This analysis was conducted on the data available for the 52 nurses.

Score on the BDI was the only factor to significantly predict a high BSQ score independent of other related factors. This suggests that other indices of general mental state do not predict a high

level of concern with shape allowing for depressed mood. This finding was explored further. Using a partial correlation, self-esteem and score on the Obsessive-Compulsive subscale were not significantly related to concern with shape controlling for level of depression (for self-esteem, Partial $r = -.03$, $P > .05$; and for the Obsessive-Compulsive subscale, Partial $r = .22$, $P > .05$).¹

Thus, these findings show that, allowing for depressed mood, a high level of concern with shape was not associated with a poor mental state.

Discussion

Results from this study supported the prediction that a high level of concern with shape would be associated with depressed mood. Among women in the community a high BSQ score was associated with low mood as measured by the BDI but not as measured by the SCL-90. This suggests that these two measures of depression assess different aspects of low mood. Contrary to prediction, the association between depressed mood and concern with shape was not greater among women for whom shape was particularly important. This suggests that placing great importance on shape does not strengthen the relationship between the level of concern with shape and depressed mood. However, the measure used to assess the importance of a slim body shape was simple and was unvalidated. It is possible that this measure provided an inadequate assessment of the importance of a slim shape, which may explain why the relationship between depressed mood and concern with shape was similar across women who placed different importance on slimness.

One limitation of the study was that the association between concern with shape and depressed mood was correlational and did not indicate direction of causality. It is possible that low mood may exacerbate concern with shape; but it is also possible that if shape is important then a high level of concern with shape may lower mood. Alternatively, both depressed mood and concern with shape may be products of a third factor, and once exacerbated may reinforce each other in a negative cycle of self-deprecation. To resolve direction of causality it would be necessary to show a high level of disturbance on one factor preceding a high level of disturbance on the other.

With regard to general mental state, aside from mood, only low self-esteem and obsessive compulsive thoughts and behaviour were associated with a high level of concern with shape, and these relationships were not independent of depressed mood. Both low self-esteem and obsessive-compulsive thoughts are closely linked with depression. Low self-esteem is conceptually related to the self-depreciatory thoughts which typically accompany depressed mood (Beck, 1973); and obsessive-compulsive thoughts commonly accompany depressed mood (Kendell and Descipio, 1970). It would thus appear that low mood and feelings of self-depreciation are associated with a high level of concern with shape, but that such concern is unrelated to a poor mental state.

¹ This finding provides a further measure of validation for the BSQ (ie. divergent validity), because it suggests that a high score on this questionnaire does not merely reflect general psychopathological disturbance but measures specific concerns with shape which are associated with depressed mood and disturbed eating.

To conclude, findings from this study suggest that a high level of concern with shape is associated with depressed mood, and that the association is relatively uniform across women who differ in the degree of importance they place on a slim shape. A more generally poor mental state was found to be unrelated to a high BSQ score, suggesting that the BSQ measures specific concerns about shape which are associated with low mood but not with more general psychopathological disturbance.

The relationships observed between depressed mood and concern with shape suggests that further research is needed. Since mood changes are common among women, such as with phase of the menstrual cycle (Moos,1968), it is important to know whether a change in mood is accompanied by a change in concern with shape. Such concern has been reported to fluctuate with mood among severely obese people who have marked body shape disparagement (Stunkard,1976), but the lability of concern with shape and its relationship with changes in mood has not been assessed among women in general.

Section 6

Change in concern with shape and its relation to mood and phase of the menstrual cycle

Introduction

In Section 5 of this Chapter a significant association was reported between concern with shape and depressed mood. However, the association was correlational and did not indicate whether a high level of disturbance on one of these factors may exacerbate a high level of disturbance on the other. Nevertheless, the observed relationship between concern with shape and mood suggests that these two factors may co-vary. There has been no empirical investigation into the lability of concern with shape and it is not known whether such concern changes over time. In contrast, studies of the menstrual cycle have shown that mood changes across time. For example, Moos (1968) reported that depression was greater in the days preceding and soon after the onset of menstruation compared with mid-cycle. Similarly, May (1976) found that 50 percent of a sample of normal young women experienced their lowest mood preceding the onset of menstruation, and another 40 percent during menstruation. Paige (1971) has suggested that cyclical variation in mood may have a hormonal link since comparable mood changes have not been found among subjects taking the contraceptive pill. The associations between mood and phase of the menstrual cycle, and between concern with shape and mood, suggest that low mood occurring premenstrually or early during menstruation may be associated with a concurrent increase in concern with shape.

In addition to mood, various other symptomatic changes have been associated with phase of the menstrual cycle, and have usually been subsumed under the general heading of *premenstrual tension*, or PMT. Beumont et al (1975) defined PMT as a cluster of physical and psychological symptoms which occur episodically in relation to phase of the menstrual cycle. Not all women report PMT, although the estimated proportion of women who suffer from this distress has varied considerably between studies (eg. 6-95%; May, 1976). Aside from mood, two other factors suggest that concern with shape may vary with phase of the menstrual cycle. First, a slight increase in weight is common around the time of menstruation (Moos, 1968). A high weight has been found to be significantly associated with a high level of concern with shape (Section 1 of this Chapter), and it is therefore conceivable that an increase in weight may lead to an increase in concern with shape. Second, feelings of bloatedness have been reported to be greater around the time of menstruation compared with intermenstrually (Moos, 1968), and it is possible that feeling bloated may increase concern with shape.

The aims of this investigation were two-fold:

- (1) To examine whether depressed mood may exacerbate concern with shape, using phase of the menstrual cycle as a means of studying change in mood;
- (2) To examine whether other symptoms associated with phase of the menstrual cycle may exacerbate concern with shape, such as an increase in weight, feelings of bloatedness, and more general physical and psychological symptoms of PMT.

Two studies were conducted to answer these questions.

Study 1: A cross-sectional study of the menstrual cycle

The first study tested the prediction that level of concern with shape as measured by the BSQ would be greater around the time of menstruation compared with intermenstrually.

Method

Subjects

Eighty-five undergraduate students¹ were approached and asked to participate in a study of *particular relevance to women*. All agreed. The students were given no details about the study until after completing the assessments.

Assessments

The students were asked to complete the Body Shape Questionnaire or BSQ (see Chapter 2) which measures concern with shape. Their age, height and weight were recorded, and they completed a question indicating their current position in the menstrual cycle. All data were anonymous.

Results

All subjects satisfactorily completed the BSQ. Nineteen of the women expected to begin menstruating within the next week, and were labelled *pre-menstrual* subjects. Twenty were currently menstruating, and were labelled *menstrual* subjects. Forty-six were not menstruating and did not expect their period to begin within the next week, and were labelled *intermenstrual* subjects. None reported amenorrhoea.

Table 3.6.1 shows that the BSQ scores were similar for all three groups.

¹ These subjects are also reported in Chapter 2.

Table 3.6.1
BSQ in relation to phase of the menstrual cycle

	Premen- strual Subjects (N=19) \bar{x}/sd	Menstrual Subjects (N=20) \bar{x}/sd	Intermen- strual Subjects (N=46)	F	df	P
BSQ	79.7	97.0	88.5	1.75	2,82	>.05
Score	31.3	29.8	27.6			

Brief discussion

Results from this first study indicated that among a sample of young women, score on the BSQ was independent of phase of the menstrual cycle. This finding suggested that concern with shape does not co-vary with symptoms associated with PMT. However, no assessments were made of change in symptoms of PMT, and it is possible that the majority of the women did not experience such symptoms. If this were the case it may explain why concern with shape was unassociated with phase of the menstrual cycle. Furthermore, the design of the study was cross-sectional, and the assignment to phase of the menstrual cycle may have been unreliable, which may have masked differences in level of concern with shape between the three phases. Also, some subjects were taking the contraceptive pill which may have suppressed cyclical variation in mood and concurrent concern with shape.

Study 2a: A longitudinal study of the menstrual cycle

A second study was conducted to assess whether concern with shape co-varies with mood and other symptoms associated with phase of the menstrual cycle. This study aimed to overcome the methodological problems of the first study. Assessments were made of mood, weight, bloatedness and other symptoms of PMT; subjects were not taking the contraceptive pill; and the design of the study was longitudinal. It was predicted that increases in depressed mood, weight, feelings of bloatedness and other symptoms of PMT would be associated with an increase in level of concern with shape.

Subjects

All female students living in three halls of residence were approached and asked a number of questions under the guise of *a study of student health*. Subjects were asked about their weight, whether they were currently taking the contraceptive pill and the date of their last menstrual

period. These questions were asked along with a number of other questions (Appendix 16). Fifty-eight young women who weighed within 20 percent of average weight (self-report data) were asked to participate in the study. All agreed.

Procedure

Each subject began the study on the day of the week which coincided with the predicted start of menstruation. This prediction was based on information gained from the initial screening questions reported above. Every week for between four and six weeks subjects completed the BSQ. The time scale at the top of the questionnaire was amended to refer to feelings over the past week.² Subjects also completed six visual analogue scales each day, referring to the degree to which they had felt physical symptoms of tiredness, aching and bloatedness; and psychological symptoms of depression, irritability and tension (Appendix 17). The women were instructed to complete these measures at the same time each day, and that if they forgot they were to leave them blank and not fill them in retrospectively. Subjects were visited weekly to check compliance. During this visit subjects were asked whether they had begun their menstrual period within the last week. This question was embedded among a number of other questions about health (Appendix 18). Subjects were weighed weekly at approximately the same time each week. Each subject ended the study when they had completed data for a full menstrual cycle.

Scoring the data

Defining phase of the menstrual cycle

The *premenstrual* phase was defined as the five days preceding the start of menstruation. The *menstrual* phase was defined as the five days following the start of menstruation, including the day menstruation started. The *intermenstrual* phase was defined as any time excluding the premenstrual and menstrual phases plus two days either side of each.

Scoring the BSQ

A BSQ score was derived for the three phases of the menstrual cycle according to the following rules:

- (1) A BSQ score referred to the premenstrual phase when at least three days of the questionnaire's time scale covered the five days of the premenstrual phase. Therefore, score on the questionnaire for that week covered over half of the premenstrual phase.
- (2) A similar rule was followed for scoring the BSQ for the menstrual phase. However, for 10 subjects, BSQ scores for the premenstrual and menstrual phases were derived from the same questionnaire. This was because the questionnaire referred to three days of one phase and four days of the other. For these subjects the questionnaire score which covered four days of

² The original questionnaire reported in Chapter 2 refers to feelings over the past month.

one phase was accepted; and the score for the other phase was coded as a missing value.

- (3) For the intermenstrual phase score on the BSQ was taken as a score which did not overlap with the premenstrual or menstrual phases or the two days either side of each. When more than one questionnaire score met these criteria the average score was taken.

Body weight

Weight for the premenstrual phase was defined as weight recorded during those five days; or for subjects who were not weighed during this time, weight recorded during the two days before the premenstrual phase. Weight for the menstrual phase was defined as weight recorded during the first five days of menstruation; or for subjects who were not weighed during this time, weight recorded during the two days after this phase. For the intermenstrual phase weight was defined as the mean of all weights not recorded during the premenstrual or menstrual phases or the two days either side of each. An index of mean weight was derived for each subject by taking the mean of all weights recorded during the study.

The visual analogue scales

For each of the six visual analogue scales a score was derived for the premenstrual phase by averaging the scores for those five days; and similarly for the menstrual phase. For the intermenstrual phase, a mean score for each visual analogue scale was derived by averaging the scores which referred to any time not covered by the premenstrual or menstrual phases or the two days either side of each.

Data missing for the visual analogue scales

Some subjects forgot to complete the visual analogue scales every day. The average of their incomplete data for each phase was accepted when it covered at least two days. Examining incomplete data from the visual analogue scales, subjects forgot to complete the measures on an average of 1.7 days.

Results

Subjects

One subject did not remember to complete many of the daily visual analogue scales and was excluded from data analysis. A further six subjects were excluded because they did not begin menstruating within forty days of the start of the study; and three subjects were excluded because they were obese (mean MPMW of all weights recorded $\geq 120\%$). Information on the remaining 48 subjects is given in Table 3.6.2.

Table 3.6.2
Information on the women included in data analyses

	\bar{x}	sd	Range
Age	19.7	1.1	18 - 22
MPMW ¹	99.4	8.6	83 - 119
BSQ Score ²	72.8	27.5	35 - 167

1 Mean of all weights recorded during the study

2 Mean of all BSQ scores recorded during the study

Prediction 1: Change across the menstrual cycle

The BSQ scores for the three phases of the menstrual cycle were compared using repeated measures analysis of variance. Table 3.6.3 shows that compared with the intermenstrual phase, subjects did not show greater concern with their shape during the premenstrual or menstrual phases.

Table 3.6.3
BSQ scores over phase of the menstrual cycle

	Premen- strual	Menstrual	Intermen- strual	F	df	P
BSQ	74.9	75.7	75.6	0.14	2,62	>.05
sd	32.8	30.3	31.1			

It was possible that, for the majority of subjects, BSQ scores for the premenstrual phase may have been higher compared with during the intermenstrual phase, but this trend may have been masked by examining group average scores for the phases; and similarly when comparing the menstrual phase with the intermenstrual phase. Therefore, a sign test was used to determine whether BSQ scores were usually higher premenstrually or menstrually compared with intermenstrually. BSQ scores were higher premenstrually compared with intermenstrually for 16 out of 38 women (the remaining cases had missing data for one of the phases), which was not statistically significant ($Z=0.34$, $P>.05$). Similarly, BSQ scores were higher menstrually compared

with intermenstrually for 18 out of 37 women, which again was not statistically significant ($Z=0.35$, $P>.05$). Thus, BSQ scores were not consistently higher during the premenstrual and menstrual phases compared with the intermenstrual phase.

These findings showed that for the complete sample of women concern with shape did not vary across phase of the menstrual cycle. However, it was possible that the women showed no cyclical changes in mood or other symptoms of PMT, which could explain why scores on the BSQ did not vary across the menstrual cycle. Therefore, results were re-examined in relation to changes in symptoms of menstrual distress.

Mood

Table 3.6.4 shows that the complete sample of women showed no significant cyclical changes in mood.

Table 3.6.4
Changes in mood across the menstrual cycle: all subjects

	Premen- strual	Menstrual	Intermen- strual	F	df	P
Mood	4.09	4.09	3.91	0.39	2,84	>.05
sd	1.65	1.46	1.20			

It was possible that, among women who showed lower mood either premenstrually or menstrually compared with intermenstrually, there may have been concurrent changes in scores on the BSQ. Therefore, BSQ scores were re-examined for subjects who showed cyclical changes in mood, by selecting two subgroups of women:

- (i) Women who reported lower mood premenstrually compared with intermenstrually ($N=22$);
- (ii) Women who reported lower mood menstrually compared with intermenstrually ($N=18$).

Examining the significance of these mood changes using a t-test for matched samples, the group showing low mood premenstrually showed significantly lower mood compared with intermenstrually (5.0, $sd=1.52$ versus 3.8, $sd=1.32$; $t=6.60$, $df=23$, $P<.001$); and the group showing low mood during menstruation showed significantly lower mood menstrually compared with intermenstrually (4.7, $sd=1.54$ versus 3.5, $sd=1.22$; $t=5.63$, $df=20$, $P<.001$).

For the group showing low mood premenstrually, BSQ scores were compared across the premenstrual and intermenstrual phases using a sign test. Thirteen out of 22 women showed a higher score premenstrually, which was not statistically significant ($P>.05$). Similarly, for the group showing low mood during menstruation 11 out of 18 subjects showed a higher BSQ score

menstrually compared with intermenstrually, which again was not statistically significant ($P>.05$). These results show that, among women who reported lower mood premenstrually or menstrually compared with intermenstrually, BSQ scores were not consistently higher in the premenstrual or menstrual phases.

Thus, low mood around the time of menstruation was not associated with a high level of concern with shape.

Weight

Table 3.6.5 shows that the complete sample of women showed no significant change in body weight across phase of the menstrual cycle.

Table 3.6.5
Changes in weight across the menstrual cycle: all subjects

	Premen- strual	Menstrual	Intermen- strual	F	df	P
MPMW	99.2	99.2	98.9	1.42	2,80 ¹	>.05
sd	8.64	8.63	8.55			

1 Seven subjects were not available to be weighed at one of the weekly meetings: this data was coded as missing.

Two subgroups of women who showed changes in weight were selected as follows: i) women who weighed more during the premenstrual phase compared with the intermenstrual phase ($N=27$); and ii) women who weighed more during the menstrual phase compared with the intermenstrual phase ($N=24$). Although these changes were statistically significant, Table 3.6.6 shows that there were no significant changes in scores on the BSQ. Thus, level of concern with shape did not vary across the menstrual cycle even among women who showed small but significant changes in weight.

Table 3.6.6
Change in BSQ scores in relation to increases in weight

	Premen- strual	Menstrual	Intermen- strual	t	df	P	N
Weight	100.1		99.0	7.11	26	.001	27
sd	8.9		8.8				
BSQ	71.8		71.7	0.02	23	>.05	24
sd	32.2		30.0				
Weight		100.2	99.3	7.95	23	.001	24
sd		8.6	8.6				
BSQ		68.4	68.3	0.05	19	>.05	20
sd		31.9	31.5				

Thus, a change in weight across the menstrual cycle was not associated with a change in concern with shape.

Bloatedness

Although the complete sample of women showed no change in level of concern with shape across the menstrual cycle, this null finding was not attributable to these women not experiencing feelings of bloatedness at the time surrounding menstruation. Table 3.6.7 shows that using repeated measures analysis of variance, subjects reported feeling more bloated premenstrually and menstrually compared with intermenstrually.

Table 3.6.7
Cyclical changes in bloatedness: all subjects

	Premen- strual \bar{x}/sd	Menstrual \bar{x}/sd	Intermen- strual	F	df	P
Bloated- ness	3.01 2.55	3.15 2.58	2.46 ¹ 2.26	5.00	2,84	<.01

1 Significantly different from the menstrual phase: Tukey's HSD multiple range test.

Thus, feelings of bloatedness at the time of menstruation were not associated with a high level of concern with shape.

General symptoms of PMT

Change in scores on the BSQ were examined in relation to three general measures of PMT:

- (i) For each subject a measure of physical symptoms was derived for each phase by taking the mean of the visual analogue scale scores for bloatedness, tiredness and aching;
- (ii) For each subject a measure of psychological symptoms was derived for each phase by taking the mean of the visual analogue scale scores for depression, irritability and tension;
- (iii) For each subject a measure of general symptoms was derived for each phase by taking the mean of all six visual analogue scale scores associated with menstrual symptomatology.

Table 3.6.8 shows that using repeated measures of analysis of variance, the complete sample of women showed no significant changes in symptoms of PMT across phase of the menstrual cycle.

Table 3.6.8
Cyclical changes in menstrual symptoms

	Premen- strual	Menstrual	Intermen- strual	F	df	P
Physical Symptoms	3.57 1.87	3.66 1.90	3.49 1.64	0.48	2,84	>.05
Psychological Symptoms	3.48 1.68	3.65 1.65	3.55 1.51	0.46	2,84	>.05
General Symptoms	3.52 1.60	3.66 1.54	3.52 1.47	0.64	2,84	>.05

Although the complete sample of women did not show symptoms of PMT, as shown in Table 4.6.8, subjects who showed cyclical changes on the three measures of PMT measures were selected.

A subject was considered to show premenstrual physical symptoms when these symptoms were greater premenstrually compared with intermenstrually; and was considered to show menstrual physical symptoms when these were greater menstrually compared with intermenstrually. Similar rules were followed for defining psychological and general symptoms. Table 3.6.9 shows that that among the sub-groups of subjects, symptoms of PMT were greater premenstrually or menstrually compared with intermenstrually.

Table 3.6.9
Changes in symptoms among subjects who showed PMT

	Premen- strual \bar{X}/sd	Menstrual \bar{X}/sd	Intermen- strual \bar{X}/sd	t	df	P	N
Psychological Symptoms	4.28 1.69		3.45 1.58	5.83	20	.001	21
Psychological Symptoms		3.45 1.78	2.48 1.53	4.92	9	.001	10
Physical Symptoms	4.12 1.79		3.39 1.77	3.57	14	.003	15
Physical Symptoms		3.98 1.99	3.12 1.69	3.56	15	.003	16
Overall Symptoms	4.00 1.72		3.32 1.65	4.69	19	.001	20
Overall Symptoms		3.53 1.52	2.93 1.57	5.07	15	.001	15

Table 3.6.10 shows that using a sign test, among subjects who showed physical, psychological and general symptoms associated with PMT, scores on the BSQ were not consistently higher during either the premenstrual or menstrual phases compared with the intermenstrual phase.

Table 3.6.10
Number of subjects whose BSQ score was higher during the
Premenstrual or menstrual phases compared with the
Intermenstrual phase

	Premenstrual versus Intermenstrual Phase	P	Menstrual versus Intermenstrual Phase	P
Physical Symptoms	$\frac{11}{22}$	>.05	$\frac{11}{24}$	>.05
Psycholo- gical Symptoms	$\frac{7}{19}$	>.05	$\frac{12}{19}$	>.05
General Symptoms	$\frac{12}{24}$	>.05	$\frac{13}{25}$	>.05

Thus, symptoms of PMT were not associated with a high level of concern with shape.

Summary

Concern with shape did not vary with phase of the menstrual cycle for the complete sample of young women, even though these women experienced significant feelings of bloatedness at the time surrounding menstruation. Similarly, concern with shape did not vary among subgroups of women who showed significant changes in mood, body weight and more general symptoms of PMT.

Preliminary discussion

This second study of concern with shape in relation to phase of the menstrual cycle was designed to overcome the methodological problems associated with the first study, but nevertheless had several limitations. First, score on the BSQ referred to a seven day period of time, and it was hoped that by estimating the start of menstruation for each subject the questionnaire would cover at least four days of the premenstrual or menstrual phases. However, since subjects were very poor at predicting the start of menstruation, score on the BSQ commonly referred to only three days of the premenstrual or menstrual phase; and although three days was over half the duration of these phases, it was less than half the period of time covered by the questionnaire. This may have masked possible small changes in level of concern with shape

experienced premenstrually or menstrually. Second, the complete sample of women did not show changes in mood or other symptoms associated with phase of the menstrual cycle, which may explain why this sample of women showed no change in concern with shape across the menstrual cycle. Furthermore, among the sub-group of women who showed changes in mood and other symptoms of PMT, the level of change across the three phases was not great, which may be attributable to the age of the women studied. All were young, and premenstrual symptoms have been reported to increase with age (Moos,1968). It is possible that changes in mood and other symptoms were insufficiently severe to be associated with a concurrent change in concern with shape.

Third, there has been debate about whether PMT is attributable to womens' expectations of symptoms reported to occur either premenstrually or menstrually (eg. Slade,1984). It was therefore important that subjects were ignorant of the aims of the study. Before de-briefing a randomly selected sub-group of 25 women were asked about their perceived aims of the study. Although none guessed that the study measured level of concern with shape in relation to mood and phase of the menstrual cycle, 10 thought the study was about the menstrual cycle. Since at least some subjects guessed that the study was about changes in symptoms in relation to menstruation they may have attributed minor fluctuations in mood and other symptoms to PMT, which in turn may have negated any concurrent increase in concern with shape.

Results from this study suggested that concern with shape does not vary across phase of the menstrual cycle with changes in mood, weight, feelings of bloatedness or more general symptoms of PMT. Thus, despite being related to mood, score on the BSQ appeared to be independent of slight changes in mood. However, it is possible that general and perhaps larger changes in mood independent of phase of the menstrual cycle may be associated with a concurrent change in level of concern with shape. Women may attribute low mood experienced at the time of menstruation to premenstrual symptoms and may therefore not experience concurrent changes in level of concern with shape; whereas it is possible that low mood experienced independent of phase of the menstrual cycle may not be attributed to premenstrual tension, and may lead to an increase in concern with shape. It is conceivable that under these circumstances mood and concern with shape may co-vary.

Study 2b: The lability of concern with shape and changes with mood

The data from Study 2 were re-examined to investigate whether concern with shape co-varies with mood independent of phase of the menstrual cycle. In addition, the lability of concern with shape was examined since this had never previously been investigated (as was discussed in Section 5 of this Chapter).

Scoring the data

- (i) Scores for the mood visual analogue scale were averaged over each week, which yielded an index of mood corresponding with each BSQ score.
- (ii) A mean BSQ score was obtained for each subject by averaging the four or five scores on the questionnaire completed over the course of the study.
- (iii) An index of BSQ variability was derived by calculating the average difference between all BSQ scores for each person. For example, for subject number 1 the difference between the first and second BSQ scores was calculated, and the difference between the first and third, and so on. The sign of the differences was disregarded and the mean of the differences derived.

Results

Change in concern with shape in relation to change in mood

Change in BSQ score was examined in relation to change in mood in three ways:

- (1) For each subject the four or five BSQ scores were correlated with mood scores corresponding to the same time periods. Due to the small number of data points for each person Spearman's Rank correlation coefficient was used. The mean correlation for the 48 subjects was low ($r=.19$, $sd=.53$). However, this mean correlation masks considerable variation between subjects, with some showing a very close relationship between changes in scores on the BSQ and mood (eg. $r=.82$); while others showed no relationship (eg. $r=.00$). 30 subjects showed a positive correlation, and 16 showed a negative correlation; and using a sign test, significantly more subjects showed a positive correlation ($Z=2.17$, $P<.02$, one-tailed test). Half the subjects showed a correlation above 0.40. Figure 3.6.1 illustrates differences in co-variation between mood and the BSQ for two markedly contrasting subjects. Since the BSQ and mood were measured on different scales, scores are plotted as standardised or Z scores. It is apparent that, compared with the low BSQ scorer, the high scorer tended to show a closer association between changes in mood and score on the BSQ. The significance of this finding was tested. Mean BSQ scores for individual subjects were divided by a median split. Using the Mann-Whitney U-test, compared with low BSQ scorers, high scorers tended to show a higher correlation between the BSQ and mood (mean ranks=21.1 versus 27.9 respectively; $Z=1.68$, $P<.09$).³
- (2) For each subject their highest and lowest depression scores were selected and BSQ scores corresponding to the same periods of time were examined. Using the Wilcoxon matched-

³ This finding may have spurious; ie. the correlation between the BSQ and mood may have been higher among the high BSQ scorers than among the low BSQ scorers simply because there was greater variability in high BSQ scores.

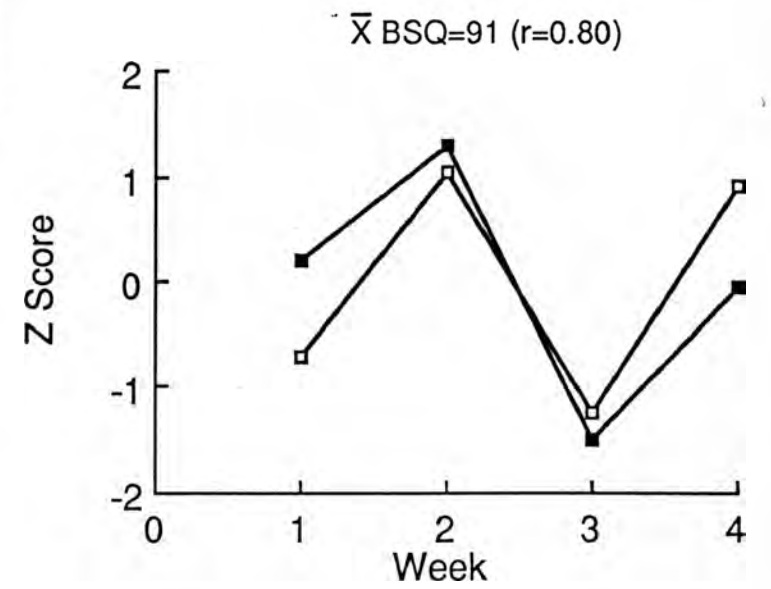
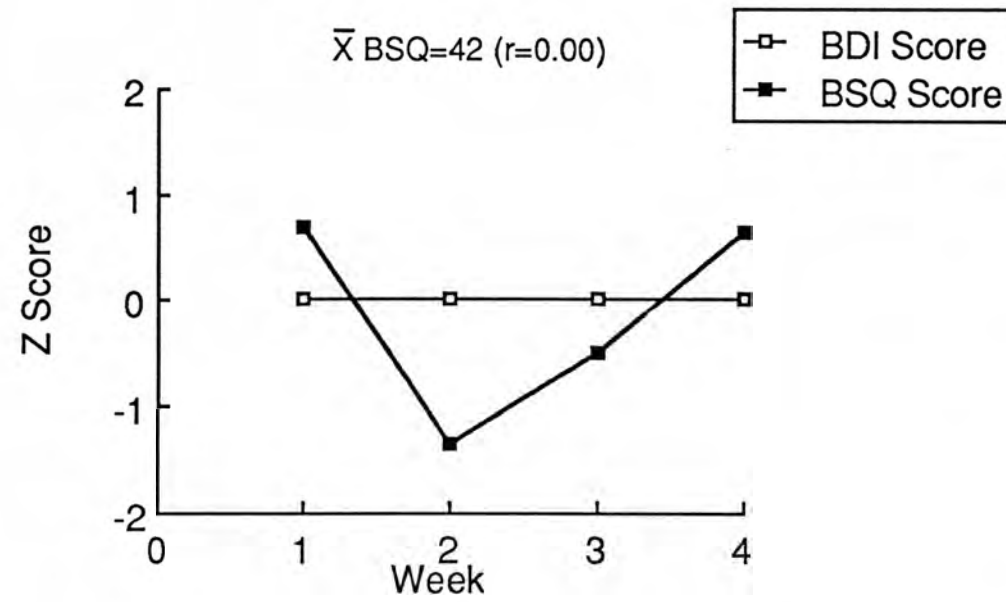


Figure 3.6.1
Changes in concern with shape and mood: two contrasting subjects

pairs signed-ranks test, BSQ scores were higher during the depressed mood period compared with the undepressed mood period for 30 of the 48 subjects, or 63 percent, which was statistically significant ($Z=2.25$, $P<.03$).

- (3) Highest and lowest BSQ scores for each subject were selected, and mood scores corresponding to the same periods of time were examined. Using the Wilcoxon matched-pairs signed-ranks test, mood was significantly lower during the high BSQ period compared with the low BSQ period: 32 of the 48 subjects or 67 percent showed a lower mood during the high BSQ period compared with the low BSQ period (mean ranks=24.6 versus 22.7, $Z=2.36$, $P<.02$). This co-variation between mood and the BSQ was slightly higher among the high BSQ scorers. Dividing mean BSQ scores using a median split, among high scorers, 18 out of 24 subjects or 75 percent were more depressed during the high BSQ period compared with the low BSQ period (mean ranks=11.8 versus 12.9 respectively, $Z=2.24$, $P<.03$).

Thus, these findings suggest that concern with shape and mood co-varied independent of phase of the menstrual cycle.

Lability of concern with shape

The average BSQ variability score for the group of 48 women was 7.5 ($sd=6.18$), with a range from 0 to 33.2. The greatest difference between 2 consecutive BSQ scores for 1 subject was 52. Thus, some subjects showed remarkably stable BSQ scores over a four to five week period; while others showed markedly labile scores. Figure 3.6.2 illustrates markedly different changes in BSQ scores for two contrasting subjects.

Figure 3.6.2 suggested that high BSQ scores may have been more labile than low scores. The significance of this finding was tested. Mean BSQ scores for the 48 subjects were divided using a median split, and BSQ variability scores compared for the two groups. Since the index of variability was not normally distributed (skewness=2.23) with more women showing stable scores compared with variable scores, the Mann-Whitney U-Test was used. Compared with subjects who showed a low BSQ score, subjects who showed a higher score also showed significantly more variable scores (mean ranks=17.6 versus 30.7 respectively; $Z=3.29$, $P<.001$).

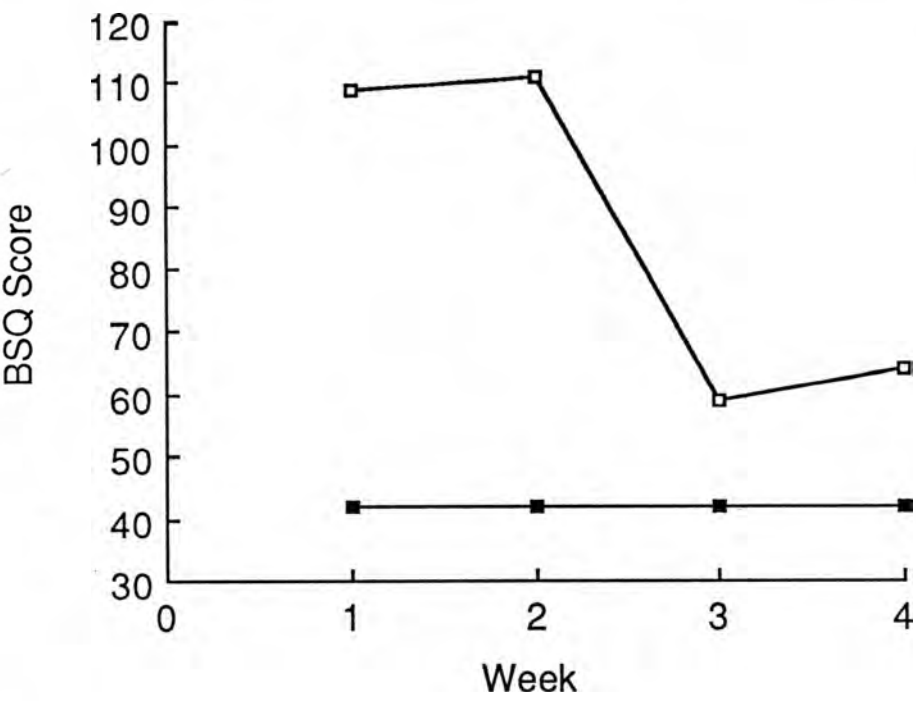
Thus, some subjects showed a very stable level of concern with their shape while others showed very labile concern, and this lability was associated with a high level of concern with shape.

Discussion

This study examined the lability of concern with shape among normal women, and tested the prediction that a change in level of concern would be positively associated with a change in mood.

Some subjects showed remarkably stable BSQ scores over a four to five week period, while others showed markedly labile scores. Degree of lability was associated with level of concern

Figure 3.6.2
The lability of concern with shape: two contrasting subjects



with shape: low BSQ scorers were more likely to show consistently low scores, while high scorers showed more changeable scores. Although the small changes in mood occurring with phase of the menstrual cycle were unassociated with changes in concern with shape, larger mood changes occurring independent of the menstrual cycle were associated with concurrent changes in concern with shape. Thus, concern with shape and mood co-varied, but this was independent of phase of the menstrual cycle.

The observed relationships were associations and do not indicate direction of causality. Since a change on one factor may be closely followed by a change on the other factor, the frequency scale of the BSQ may render this measure unsuitable for measuring changes in level of concern with shape over a very short period of time.

It is important to know whether the observed relationship between changes in concern with shape and changes in depressed mood obtains among patients with eating disorders who are characterised by a high level of disturbance on both these factors. Mood changes are common among such patients (Cooper and Fairburn, 1986), and an improvement in mood has been found to occur during treatment for an eating disorder (Eckert et al, 1982; Fairburn et al, 1985). It is therefore conceivable that a change in mood occurring during treatment would be accompanied by a concurrent change in concern with shape.

Chapter 4

Body Size Perception Among Women In The Community

Section 1

Perception of body size and depressed mood

Introduction

There has been considerable research into body size overestimation among patients with anorexia nervosa, and more recently some research among patients with bulimia nervosa (as was reviewed in Chapter 1). Some studies have found that patients with anorexia nervosa overestimate their body size more than normal young women (eg. Garner et al,1976); and most studies have found that patients with bulimia or bulimia nervosa overestimate their size more than normal women (eg. Whitehouse et al,1986), and sometimes more than patients with anorexia nervosa (Touyz et al,1985). However, all studies of body size perception in patients with eating disorders have found a considerable range in estimations, with some patients markedly overestimating and others underestimating. Furthermore, although patients with eating disorders have often been found to overestimate their size more than normal young women, there has been considerable overlap between the estimations of the two groups, with some normal women overestimating as much as the patients. It is therefore conceivable that factors commonly found among patients with eating disorders but which are also found among women in the community may give rise to body size overestimation. Although the significance of body size overestimation in bulimia nervosa has received very little attention, a range of factors have been reported to be associated with body size overestimation among patients with anorexia nervosa. Depressed mood has been one such factor identified (eg. Garfinkel and Garner,1984).

Despite the considerable attention devoted to body size overestimation, there has been very little research into dissatisfaction with body size (ie. the discrepancy between perceived and desired size). This is an important omission since it could be argued that perceived size *per se* is less important than dissatisfaction with body size. A subject may markedly overestimate her size but be content with her size. Conversely, a subject may accurately assess her body size but have a strong desire to be much thinner. Such dissatisfaction would appear to be a useful index of psychopathological disturbance. Results from two published studies (Freeman et al,1985a; Williamson et al,1985) have suggested that patients with bulimia may be markedly dissatisfied with their body size. Only one study (Freeman et al,1983) has made a preliminary assessment of the significance of body size dissatisfaction,¹ and found that among patients with bulimia dissatisfaction was associated with depressed mood.

Thus, among patients with eating disorders, both body size overestimation and body size dissatisfaction have been found to be associated with depressed mood. In Section 5 of Chapter 1

¹ The study by Freeman et al (1985a) investigated a range of factors associated with both body size dissatisfaction and body size overestimation in patients with bulimia, but the data were analysed using principal components analysis (as was discussed in Chapter 1), and it is therefore difficult to interpret findings.

a hypothesis was outlined in an attempt to account for disturbances in body size perception, which encompasses the association between body size overestimation, body size dissatisfaction and depressed mood. It was suggested that negative self-appraisal as an associated feature of low mood may give rise to overestimating body size and a high level of dissatisfaction with body size, particularly among women for whom body shape is important. A slim shape appears to be important to most women (Rodin et al,1984), but particularly to patients with eating disorders (Fairburn,1985). Patients with anorexia nervosa and bulimia nervosa are characterised by a high level of depression (eg. Eckert et al,1982; Cooper and Fairburn,1986), but clearly depressed mood is also found among women with no eating disorder. An association between body size overestimation, body size dissatisfaction and depressed mood among women with no eating disorder may help to explain why overestimation and dissatisfaction are commonly found among patients with eating disorders.

The aim of this study was to examine further the relationship between depressed mood and disturbances in body size perception. It was predicted that among normal young women with no eating disorder, depressed mood would be associated with body size overestimation and body size dissatisfaction. Since there have been no previous reports on an association between desired size and mood, no specific prediction was made about a possible relationship between these two factors.

Subjects

Ninety-one female students were randomly approached and asked to participate in a *Visual Perception Experiment*. All agreed.

The image distortion method

A Panasonic WV 1400 video camera was modified to allow images in the horizontal plane to be over- or under-scanned, thereby allowing image width to vary from very wide to very narrow. A knob connected to the camera controlled image width. The camera was fitted with a zoom lens and was used to project the image of a photograph onto an 18 inch monitor.

One problem with this equipment was that the image contrast changed across levels of distortion. When narrowly distorted the image was very dark, whereas when widely distorted the image was grey and tended to merge with the background. This was a problem because perception of size is influenced by the contrast between foreground and background (Goldstein,1980). Therefore, a light-coupling device was attached to the camera which varied illumination level with level of distortion, making image contrast constant across all levels of distortion.

Image width was indicated on a voltmeter, and voltmeter readings were converted to percentages expressing degree of distortion. These percentages were derived in the following manner. A piece of graph paper was filmed by the camera and the image of the squares displayed on the monitor. Image width was adjusted so that the width of a square in the centre of the

monitor was equal to its length. This produced a voltmeter reading corresponding to correct width. Image width was then varied at regular intervals across all levels of distortion, and the width of the squares and corresponding voltmeter readings were recorded. Square width was plotted against voltmeter reading and the relationship between the two examined. They were not quite linearly related across all levels of distortion, and so percentages were adjusted to produce a linear relationship. This was achieved using the equation $y=a+bx+cx^2$, where x represented the voltmeter reading in millivolts, y represented the size of the image on the monitor, and a , b and c represented constants which gave the best estimate of y given x .

Since the voltmeter reading corresponding to correct width was known, it was possible to express all voltmeter readings as percentages of correct width: 100 percent represented correct width, percentages less than 100 represented images narrower than correct width, and percentages greater than 100 represented images wider than correct width. Image width varied between 50 and 200 percent of correct width.

Procedure for measuring body size perception

After entering the experimental room subjects were asked to wear a black leotard and to stand in a standardised frontal posture against a white background. They were photographed from a distance of 2m using a Polaroid camera which produced an instantly developed picture 7.3cm by 9.5cm. Subjects then dressed and sat 1m in front of the monitor. The photograph of the subject was scanned by the video camera and the image projected onto the monitor. The subject was asked to:

"Adjust the image so that it corresponds to your actual size"

for estimations of perceived body size, and:

"Adjust the image to the size that you would most like to be"

for desired size. It was stressed that the subject was to be as accurate as possible and that she might move the image width in and out as many times as necessary. Standardised experimental instructions were used throughout (Appendix 19). Image width was adjusted by the subject controlling the knob attached to the video camera. The experimenter recorded estimations from the voltmeter which was concealed from the subject. There were two trials for each estimation; one with the image initially placed on its widest distortion, and one with the image initially placed on its narrowest distortion. Order of adjusting the image from wide and narrow distortions, and order of estimating perceived and desired size were counterbalanced.²

Assessments after body size perception

After completing the assessment of body size perception the height and weight of subjects were recorded. Subjects were then questioned about their eating and weight history using a brief

² The reliability of this method of measuring body size perception is reported in Appendix 20.

semi-structured interview (Appendix 21). Finally, subjects completed two questionnaires:

- (i) The Beck Depression Inventory or BDI (Beck et al,1961) was used to assess level of depression;
- (ii) The Eating Attitudes Test or EAT (Gamer and Garfinkel,1979) was used to assess disturbed eating attitudes and behaviour.

Results

Subjects

From the total sample of 91 young women tested, data analysis was conducted on those who weighed within 10 percent of average weight and who did not currently suffer from or have a history of problems with eating. Fifty young women satisfied these criteria. The remainder either did not weigh within the required weight range (N=27), or had experienced problems with eating (N=14). Information on the sample of 50 women is presented in Table 4.1.1. None was markedly depressed as measured by the BDI; and none scored above 30 on the EAT, which is a score often accepted as a threshold indicating disturbed eating attitudes and behaviour (Gamer and Garfinkel,1979). Indeed, all subjects scored considerably lower than this, with only 2 (3.9 percent) scoring above 20.

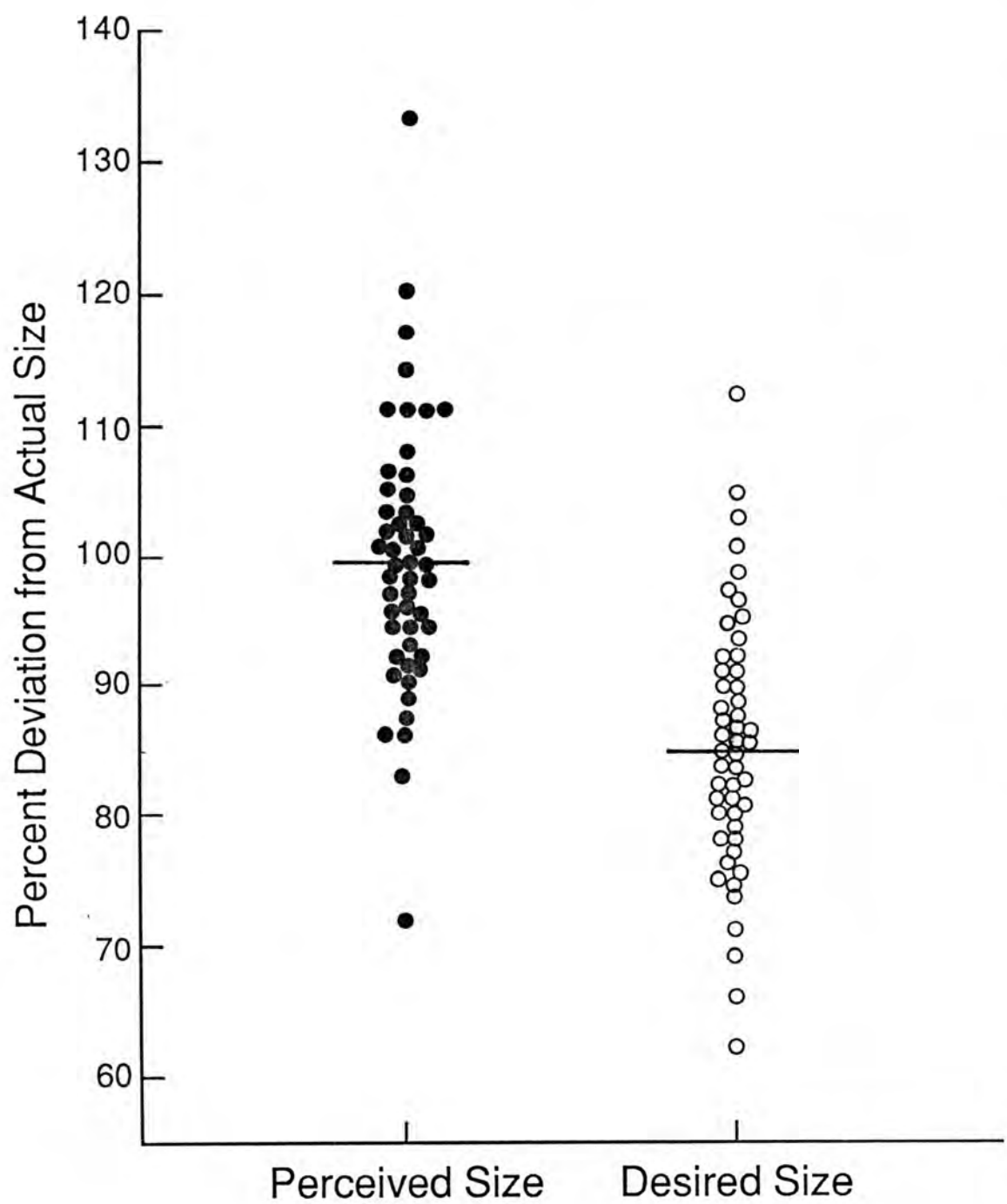
Table 4.1.1
Information on the 50 normal young women

	Mean	sd	Range
Age	20.1	1.2	18 - 24
MPMW	101.4	5.3	91.0 - 109.8
EAT	9.0	5.2	2 - 24
BDI	6.0	4.8	0 - 18

Estimations of body size

For perceived size a mean estimation was derived from the two trials; and similarly for desired size. There was a considerable range in estimations of both perceived size and desired size, as shown in Figure 4.1.1. Desired size was significantly smaller than perceived size (99.5%, $sd=10.2$ versus 84.9%, $sd=10.6$; $t=9.84$, $df=49$, $P<.001$). An index of body size dissatisfaction was derived for each subject by subtracting desired size from perceived size. The mean body size

Figure 4.1.1
Variability in body size perception: fifty normal young women



dissatisfaction score was 14.5 percent (sd=10.5), with 90 percent of subjects wishing to be smaller than they perceived themselves to be.

Thus, among this sample of 50 normal young women, there was a considerable range in estimations of perceived body size, desired size and body size dissatisfaction; but most of the women wished to be thinner than their perceived size.

Relationships between body size perception and mood

Depressed mood as measured by the BDI was found to be associated with body size overestimation ($r=.36$, $P<.01$); and tended to be associated with body size dissatisfaction ($r=.20$, $P<.08$), but was unrelated to desired size ($r=.15$, $P>.05$).

These relationships were examined further. First, estimations of perceived size were divided using a median split and BDI scores examined. Compared with low estimators, high estimators had significantly higher scores on the BDI (BDI=4.2, sd=3.8 versus 7.9, sd=5.1; $t=2.94$, $df=48$, $P<.01$). Next, dividing scores for body size dissatisfaction using a median split, subjects with low and high levels of dissatisfaction showed similar levels of mood (BDI=5.3, sd=4.5 versus 6.7, sd=5.1, respectively; $t=1.03$, $df=48$, $P>.05$). Last, BDI scores were divided using a median split. Compared with subjects with low BDI scores, those with higher scores overestimated their size significantly more (95.9%, sd=9.6 versus 103.7%, sd=9.5; $t=2.87$, $df=48$, $P<.01$), and tended to be more dissatisfied with their size (12.0%, sd=7.7 versus 17.6%, sd=12.4; $t=1.86$, $df=35.7$, $P<.07$). Figure 4.1.2 illustrates body size perception in relation to mood.

Discussion

This study shows that in a group of normal weight young women with no history of an eating disorder there was considerable variability in estimations of body size, desired size and body size dissatisfaction. As predicted, depressed mood was associated with body size overestimation, and to a lesser degree it tended to be associated with body size dissatisfaction, but was unrelated to desired size. These findings are consistent with other reports based on samples of patients with eating disorders where marked overestimation and dissatisfaction have been associated with depressed mood (Freeman et al,1983; Garfinkel and Garner,1984). Since patients with eating disorders are often characterised by a high level of depression (Eckert et al,1982; Fairburn and Cooper,1984a), the association between depressed mood and disturbances in body size perception found in this study may help to explain why many patients with eating disorders show disturbances in body size perception but why some women with no eating disorder show similar disturbances.

The relationships described were correlational and do not indicate whether depressed mood may lead to body size overestimation and body size dissatisfaction; whether overestimation and dissatisfaction may lead to depressed mood; or indeed whether overestimation, dissatisfaction and depression may be products of another factor. In order to determine direction of causality it

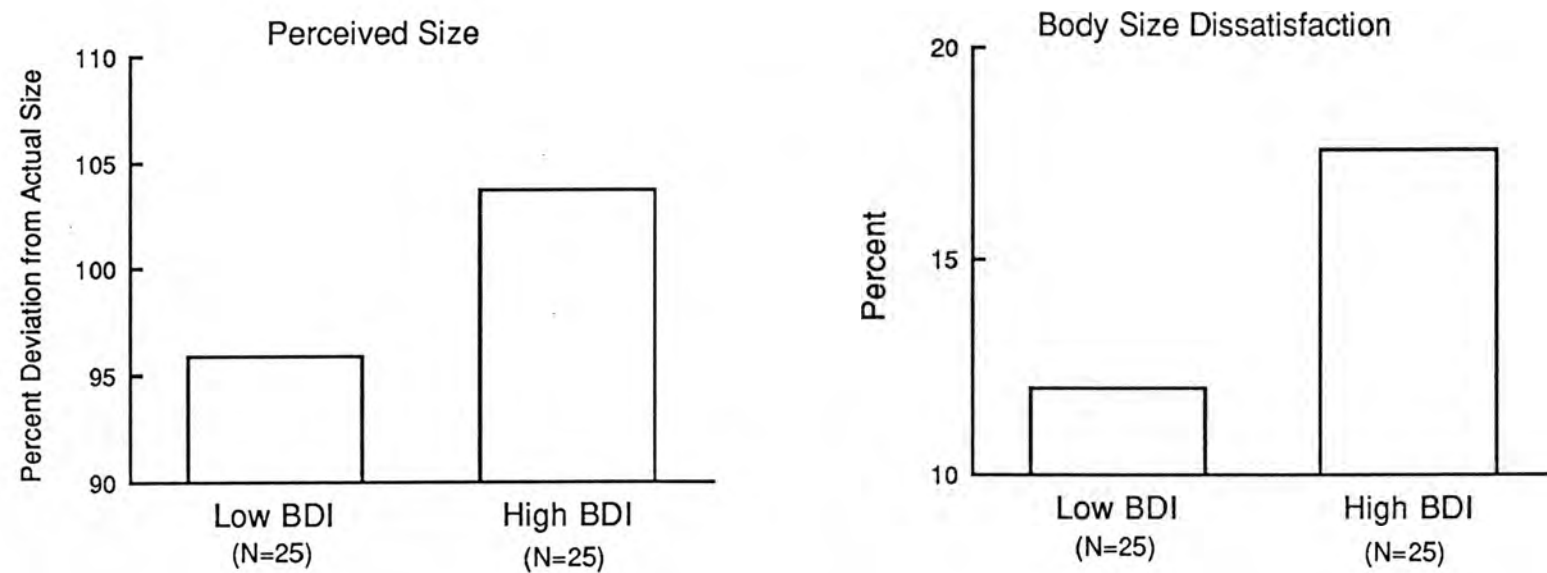


Figure 4.1.2
The relationship between body size perception and mood

would be necessary to measure one factor before and after change on the other; for example, by assessing body size perception before and after a change in mood.

Section 2

Perception of body size, concern with shape and depressed mood

Some patients with eating disorders have been reported to show a disturbance in body image in that they overestimate their body size (eg. Garner et al,1976; Whitehouse et al,1986), prefer a very small body size (eg. Freeman et al,1985a), are markedly dissatisfied with a normal body size (Freeman et al,1985a), and show a high level of concern with their shape (Fairburn and Cooper,1984a), as was reviewed in Chapter 1. However, these disturbances are not confined to women with eating disorders but have also been found among some women in the community. For example, Garfinkel and his colleagues (Garfinkel et al,1978) illustrated a considerable overlap in estimations of body size between patients with an eating disorder and normal young women; and in Chapter 2 it was found that some women in the community show a high level of concern with their shape similar to the high level found among most patients with bulimia nervosa. Thus, disturbances in body size perception and a high level of concern with shape appear to be characteristic of but are not exclusive to the eating disorders.

There have been surprisingly few reports on the relationship between perception of body size and concern with body shape, probably because there has been no satisfactory measure of concern with shape. Given that these two aspects of body image are conceptually related, it is to be expected that a disturbance on one factor would be associated with a disturbance on the other. Body size overestimation has been associated with dissatisfaction with specific body parts as measured by questionnaires (eg. the Body Image Questionnaire, Berscheid et al,1972; and the *Body Dissatisfaction* subscale of the Eating Disorder Inventory, Garner et al,1983) in patients with anorexia nervosa (Garfinkel and Garner,1984) and in patients with bulimia (Whitehouse et al,1986), but no study has investigated a similar relationship among women in the community. There has also been no study of a relationship between aspects of body size perception aside from overestimation (eg. desired size, and body size dissatisfaction in terms of the discrepancy between perceived and desired size) and aspects of concern with shape aside from dissatisfaction with specific body parts (eg. the phenomenal experience of concern with shape with its antecedents and behavioural consequences). An association between concern with shape and disturbances in body size perception among women in general may help to explain why disturbances in body size perception are common among patients with eating disorders but are also found among women in the community.

In Section 1 of this Chapter depressed mood was found to be associated with body size overestimation and tended to be associated with body size dissatisfaction. These findings are consistent with ideas in Beck's cognitive model of depression (Beck,1973), that the self-depreciatory feelings which typically accompany depressed mood may focus on body size and shape. In Chapter 1 it was suggested that depressed mood may be associated with disturbances in

body size perception and concern with shape particularly among women who place high importance on a slim shape.

The general aim of the present study was to investigate further the relationship between body size perception, depressed mood and concern with shape. In Section 1 of this Chapter an image distortion method was used to measure body size perception which showed a satisfactory degree of test re-test reliability. However, there were two problems associated with this method. First, the image displayed on the monitor was not of a high quality. Despite efforts to minimize blurred image edges at wide levels of distortion, the image was nevertheless much less sharply defined when widely distorted compared with when narrowly distorted. Touyz and his colleagues (Touyz et al,1984) used a similar method and illustrated similar problems with a poorly defined and blurred image. Second, projecting an enlarged photograph onto a screen introduced blur and shadow to the image, whereas subsequent pilot studies revealed that reducing a life-size image onto a screen produces a clearer image. Due to the limitations of the image distortion method reported in Section 1 of this Chapter, in the following study body size perception was assessed using a live image of the subject.

The specific aims of this study were:

- (1) To examine whether a high level of concern with shape is associated with disturbances in body size perception among women in general;
- (2) To test the hypothesis that depressed mood will be associated with body size overestimation and body size dissatisfaction particularly among women who show a high level of concern with their shape.

Subjects

Approximately 300 female undergraduate students, the total number attending two medical science lectures, were asked to complete the Body Shape Questionnaire or BSQ (see Chapter 2). They were also asked to indicate their age, height and weight. The responses of those who weighed within the normal range ($\pm 15\%$ MPMW) were examined. Nineteen women scored one standard deviation above the BSQ general population mean reported in Chapter 2 (ie. a BSQ score above 110); and 15 women scored one standard deviation below the general population mean (ie. a BSQ score below 53). These high and low scorers were asked to participate in a *psychoperceptual* experiment. All agreed.

Method used to measure body size perception

The same modified Panasonic video camera described in Section 1 of this Chapter was fitted with an automatic 8mm Iris Lens WVLA8A which maintained a constant level of illumination across all levels of distortion. Voltmeter readings were converted to percentages expressing degree of distortion using the same method described in Section 1. The relationship between image width and voltmeter reading was linear across all levels of distortion and it was therefore unnecessary to

adjust percentages. Image width varied between 50 percent and 220 percent of correct width.

Procedure

Subjects visited the laboratory between two and five weeks after completing the BSQ. They were asked to repeat this questionnaire and to complete the Beck Depression Inventory or BDI (Beck et al, 1961). Subjects then estimated their body size and indicated their desired size using the following procedure.

Subjects wore a black leotard and stood in a standardised frontal posture against a white background and were filmed by the video camera from a distance of 4.5m. Their image was displayed on an 18 inch monitor positioned directly above the camera. Image width was placed on its widest or narrowest setting and subjects were asked to:

"Adjust the image so that it corresponds to your actual size"

for estimations of perceived size, and:

"Adjust the image to the size that you would most like to be"

for desired size.¹ Subjects were urged to be as accurate as possible and told that they might move the image width in and out as many times as necessary. There were four trials for each estimation; two with the image initially distorted from wide, and two with the image initially distorted from narrow, in counterbalanced order.

The experimenter and voltmeter were concealed behind a curtain, and the experimenter recorded estimations from the voltmeter. Since the experimenter could not directly see the subject, it was ensured that the subject obeyed the instructions by the experimenter viewing the subject on a second monitor also concealed behind the curtain. Subjects were unaware that they were being watched, and therefore estimations were made in private.²

After completing the assessment of body size perception subjects were weighed and their height measured. The entire assessment procedure was designed so that all data were anonymous to preserve confidentiality. Subjects sealed their responses in an unmarked envelope and placed the envelope in a box containing the data of other subjects. Standardised instructions were used throughout.

Results

Subjects

Thirty-four subjects completed the assessment. Two were excluded from data analyses; one because she weighed more than 115 percent MPMW; and one because her BSQ score decreased from one standard deviation above the population mean at the time of the initial screening to an

¹ Full instructions are given in Appendix 22.

² The reliability of this method of measuring body size perception is reported in Appendix 23.

average score of 83 (see Chapter 2) at the time of visiting the laboratory.

At the time of the testing there was no overlap between the two groups on the BSQ. All subjects in the low BSQ group scored one standard deviation below the general population mean. However, not all subjects in the high BSQ group scored one standard deviation above the mean since several showed a small decrease in their score between the time of the initial screening on the questionnaire and the assessment of body size perception. Nevertheless, all 17 high BSQ scorers included in data analyses showed at least *Mild* concern with their shape (ie. BSQ > 80, see Chapter 2). As expected, the two groups differed markedly on the BSQ (43.1, sd=5.2 versus 119.7, sd=19.6; $t=15.5$, $df=18.5$, $P<.001$).

Relationships between concern with shape and body size perception

For perceived body size the two trials made from a widely distorted image and the two trials made from a narrowly distorted image were combined to produce a mean estimation; and similarly for desired size.

Table 4.2.1 shows that the two groups of women who showed very high or very low levels of concern with their shape also differed in their perception of their body size. The high concern group tended to overestimate their size more, showed a significantly smaller desired size, and were significantly more dissatisfied with their size. These group differences are illustrated in Figure 4.2.1 a and b.

Table 4.2.1
Group differences in perception of body size

	Low BSQ (N=15) \bar{x}/sd	High BSQ (N=17) \bar{x}/sd	t	df	P
Perceived Size	113.8 14.1	121.8 11.2	1.78	30	.09
Desired Size	104.0 14.2	88.6 8.7	3.75	30	.001
Body Size Dissatisfaction	9.9 12.5	33.2 11.7	5.44	30	.001

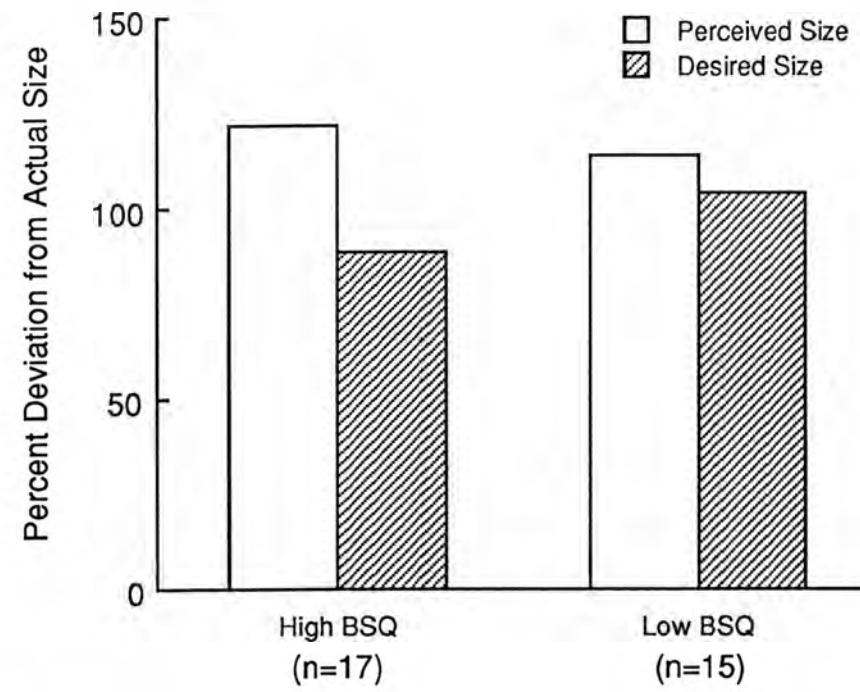


Figure 4.2.1a

The relationship between body size perception and concern with shape:
perceived size and desired size

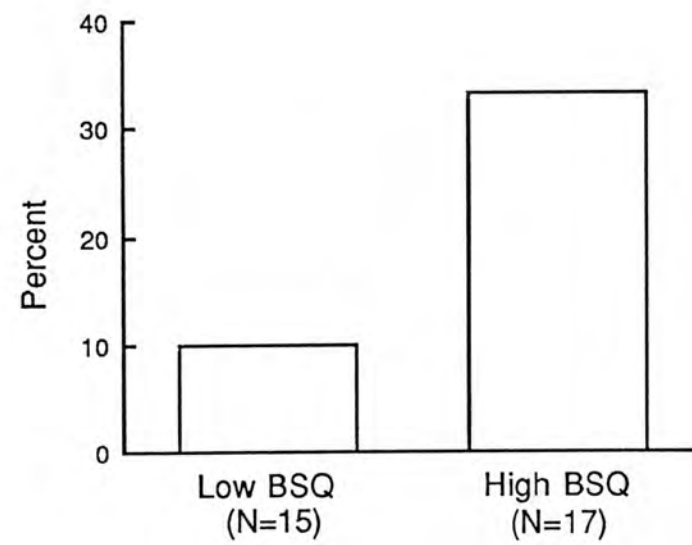


Figure 4.2.1b

The relationship between body size perception and concern with shape:
body size dissatisfaction

Relationships between body size perception and concern with shape were also examined using Spearman's rank correlation coefficient.³ The results were consistent with group differences in body size perception. For the complete sample of 32 women their score on the BSQ was significantly associated with overestimating body size ($r=.43$, $P<.01$), a small desired size ($r=-.49$, $P<.01$), and a high level of dissatisfaction with body size ($r=.69$, $P<.001$). Examining these relationships for each group separately, Table 4.2.2 shows that the BSQ was more highly related to body size overestimation and body size dissatisfaction for the high BSQ group than for the low BSQ group; but desired size was unrelated to the BSQ for each group separately.

Table 4.2.2
Correlations (Spearman's r) between the BSQ and body size perception

	High BSQ (N=17)		Low BSQ (N=15)	
	r	P	r	P
Perceived size	.33	.10	.27	>.05
Desired size	-.17	>.05	-.07	>.05
Body size dissatisfaction	.36	.08	.16	>.05

Thus, a high level of concern with shape was associated with body size overestimation, body size dissatisfaction and a small desired size.

Sections 1 and 5 of Chapter 3 reported significant associations between a high score on the BSQ and young age, a high weight and depressed mood. Table 4.2.3 shows that in the present study, although the low and high BSQ groups were of similar age, the high BSQ group was significantly more depressed; and despite attempting initially to match the two groups on weight by selecting only subjects who weighed within 15 percent of average weight, the high BSQ group weighed significantly more.

³ Chosen in preference to Pearson's coefficient since the BSQ scores were bi-modally distributed.

Table 4.2.3
Group comparisons on age, weight and depression

	Low BSQ (N=15) \bar{X} sd	High BSQ (N=17) \bar{X} sd	t	df	P
Age	19.2 1.9	19.5 1.2	0.60	30	>.05
MPMW	94.7 6.4	101.8 7.3	2.94	30	.006
BDI	2.1 1.9	9.4 8.6	3.43	18	.003

Table 4.2.4 shows that depressed mood and weight in turn were associated with body size perception.

Table 4.2.4
Relationships between mood, weight and body size perception

	BDI		MPMW	
	r	P	r	P
Perceived size	.40	.01	.25	.09
Desired size	-.17	>.05	-.29	.06
Dissatisfaction	.43	.01	.44	.01

It was therefore possible that the relationships between concern with shape and body size perception may have been mediated by the relationships between depression and weight with body size perception. Further analyses were therefore conducted to examine the relationship

between body size perception and concern with shape controlling for weight and level of depression.

In the first analysis, subjects with different levels of concern with shape were matched on level of depression. The eight subjects in the low BSQ group who scored the highest on the BDI were compared with the eight subjects in the high BSQ group who scored the lowest on the BDI. Using the Mann-Whitney U-test, Table 4.2.5 shows that the two groups showed a similar level of depression and continued to show very different levels of concern with their shape, as was required for the analysis. (The two groups were still significantly different in terms of weight.) Similar to results based on the complete samples, compared with the low concern group, the high concern group continued to show a smaller desired size and were more dissatisfied with their size, although they no longer overestimated their size more.

Table 4.2.5
Group comparisons between subjects matched on level of depression

	Low BSQ (N=8) \bar{X}/sd $\bar{X}Ranks$	High BSQ (N=8) \bar{X}/sd $\bar{X}Ranks$	Z	P
BDI	3.5 1.5 9.25	3.0 2.2 7.75	0.64	>.05
BSQ	42.4 4.9 4.50	108.9 12.4 12.50	3.37	.001
MPMW	90.9 3.8 4.75	102.2 5.5 12.25	3.15	.01
Perceived Size	111.6 11.4 7.56	116.3 9.0 9.44	0.79	>.05
Desired Size	105.1 15.6 11.25	86.3 8.3 5.75	2.31	.02
Body size Dissatisfaction	6.5 10.5 5.00	29.9 9.2 12.00	2.94	.01

In the second analysis subjects with different levels of concern with their shape were matched on weight. The eight subjects in the low BSQ group who weighed the most were compared with the eight subjects in the high BSQ group who weighed the least. Table 4.2.6 shows that using the Mann-Whitney U-test, the two groups were similar in terms of weight and continued to show different levels of concern with their shape, as was required for the analysis. (The two groups still differed on level of depression.) Similar to comparisons based on the complete samples, compared with the low concern group, the high concern group showed a significantly smaller desired size and were significantly more dissatisfied with their size, although they did not overestimate their size more.

Table 4.2.6
Group comparisons between subjects matched on weight

	Low BSQ (N=8) Mean Ranks \bar{X}/sd	High BSQ (N=8) Mean Ranks \bar{X}/sd	Z	P
MPMW	9.88 99.4 4.8	7.13 96.0 5.3	1.16	>.05
BSQ	4.50 44.3 5.6	12.50 115.0 14.2	3.36	.001
BDI	5.81 1.4 2.1	11.19 9.4 8.3	2.30	.03
Perceived Size	7.88 118.2 15.6	9.13 119.5 11.6	0.53	>.05
Desired Size	11.75 106.1 13.5	5.25 88.8 7.3	2.73	.01
Dissatis- faction	6.00 12.1 14.5	11.00 30.7 12.6	2.10	.04

It was not possible to match subjects on both weight and level of depression. However, weight and BDI scores were unrelated (Spearman's $r=.08$, $P>.05$).

In the third analysis the two groups with different levels of concern with shape were compared on measures of body size perception using analysis of covariance to control for differences in weight and mood. Table 4.2.7 shows that allowing for weight and level of depression, the two groups estimated their size similarly, but the high concern group showed a significantly smaller desired size and were significantly more dissatisfied with their size.

Table 4.2.7
Body size perception in relation to concern with shape, controlling for
Weight and level of depression

	Low BSQ Group (N=15) Adjusted \bar{x}	High BSQ Group (N=17) Adjusted \bar{x}	F	df	P
Perceived Size	118.1	117.6	0.01	1,28	>.05
Desired Size	104.7	87.9	9.11	1,28	<.01
Body size Dissatisfaction	13.4	29.7	8.25	1,28	<.01

Together, these results suggest that a high level of concern with shape is associated with disturbances in body size perception, in particular with a small desired size and dissatisfaction with body size; and that findings for desired size and dissatisfaction with body size are independent of mood and weight.

*The relationship between depressed mood and body size perception
In the context of concern with shape*

The hypothesis that depressed mood will be associated with body size overestimation and body size dissatisfaction particularly among women who show a high level of concern with their shape, was tested by examining the relationship between depressed mood and body size perception for the high and low BSQ groups separately. Results using Spearman's Rank correlation coefficient are shown in Table 4.2.8. For the high BSQ group there was a significant association between depressed mood and body size overestimation; and there tended to be an association between depressed mood and body size dissatisfaction. For the low BSQ group there was no association between body size overestimation and body size dissatisfaction with depressed mood. As in Section 1 of this Chapter, there was no association between depressed mood and desired size for either group.

Table 4.2.8
Relationships between depressed mood and body size perception in
The context of concern with shape

	Low BSQ Group (N=15)		High BSQ Group (N=17)	
	r	P	r	P
Perceived Size	-.10	>.05	.48	.03
Desired Size	.18	>.05	.24	>.05
Dissatis- faction	-.24	>.05	.31	>.05

Thus, prediction 2 was supported: compared with women who showed little concern with their shape, among those who showed a high level of concern depressed mood was more highly associated with body size overestimation and body size dissatisfaction.

Discussion

This study investigated relationships between concern with shape and perception of body size, and tested the hypothesis that depressed mood may be associated with disturbances in body size perception particularly among women who show a high level of concern with their shape. Young women who showed a very high or very low level of such concern estimated their body size and indicated their desired size. A limitation of the study was that findings were based on two small samples of women, and probably for this reason some of the trends did not reach statistical significance and should be interpreted with caution.

A high level of concern with shape was associated with disturbances in body size perception. For desired size and body size dissatisfaction these associations appeared to be independent of body weight and level of depression; although the relationship between concern with shape and body size overestimation appeared to be mediated by level of depression and weight.

Findings regarding the association between depressed mood, body size overestimation and body size dissatisfaction replicated the associations reported in Section 1 of this Chapter and supported the hypothesis that the relationship between depressed mood and disturbances in body

size perception may be mediated by a high level of concern with shape. On a more cautious note, although the association between level of depression and body size dissatisfaction was much stronger in the high BSQ group, this relationship was not statistically significant, probably due to the small sample size and the range of estimations of body size.

To conclude, both concern with shape and mood appear to be important factors predicting perception of body size among women in the community. One could predict from the associations reported that patients with bulimia nervosa, who have both marked concerns about body shape and depressed mood, would show disturbances in body size perception. Indeed, there is some preliminary evidence to support such a prediction, but it is difficult to interpret the findings because of methodological problems of the research.

Section 3

Changes in body size perception and mood: a mood induction study

Introduction

In Sections 1 and 2 of this Chapter body size overestimation and body size dissatisfaction were found to be associated with low mood. These findings are consistent with studies of body size perception in patients with eating disorders. Using similar methods of measuring perception of body size, body size overestimation has been associated with depression in patients with anorexia nervosa (Garfinkel and Garner, 1984), and body size dissatisfaction has been associated with depression in patients with bulimia (Freeman et al, 1983). There has been no published report on the relationship between mood and desired size, but earlier in this Chapter desired size was found to be unrelated to mood.

The observed relationships between body size perception and mood reported in Sections 1 and 2 of this Chapter were correlational and did not indicate direction of causality. It is possible that if shape is important, as it appears to be to most women (Rodin et al, 1984), but particularly to patients with eating disorders (Fairburn, 1985), then overestimating body size and dissatisfaction with body size may exacerbate a low mood. Rodin et al (1984) suggested that dissatisfaction with body shape may cause depression among women, but provided no empirical evidence to support this contention. It is equally conceivable that if a slim shape is important, then the self-depreciatory cognitions which typically accompany depressed mood may focus on body size and shape and may lead to overestimating body size and dissatisfaction with body size. The latter hypothesis is consistent with ideas in Beck's cognitive model of depression. Beck (1973) observed that the distorted thinking which characterises depression commonly extends to concern with physical appearance, particularly among women. Beck stated that a depressed patient often becomes preoccupied with the thought of getting fat and may even believe that they have grown fat.

One way of testing the hypothesis that depressed mood may exacerbate disturbances in body size perception is to assess body size perception before and after the onset of low mood. Such a study would be difficult to conduct naturalistically since it would necessitate identifying and testing women before the onset of depression and then re-testing them after they became depressed. Therefore, a mood induction study was conducted in the laboratory as a very stringent test of the hypothesis that low mood may lead to disturbances in body size perception. Four predictions were made:

- (1) Inducing low mood will lead to an increase in perceived body size;

- (2) Inducing low mood will lead to an increase in body size dissatisfaction;
- (3) Compared with women who show little concern with their body shape, among women who show higher concern, the induction of low mood will exert a greater effect on body size overestimation and body size dissatisfaction;
- (4) Desired size will be unaffected by a change in mood.

Method

Subjects

Eighty-five female undergraduate students from two undergraduate colleges were approached and asked to participate in a study *of particular relevance to women*. The women were given no further details about the study until after completing the assessments. All agreed.¹

Cards used for the mood induction procedure

Two sets of 25 cards were assembled, and each card displayed a self-referent statement. One set had statements with miserable connotations, eg. *I feel ashamed of things I've done*; and the other set had pleasant connotations, eg. *I feel that I am a nice person*. The miserable statements were adapted from a selection of published phrases (Williams, 1984); and the statements with pleasant connotations were invented by the author. All 50 statements are presented in Appendix 24.

Procedure

The initial assessment

First, subjects completed the BDI, which indicated level of mood over the previous month. Next, subjects estimated their body size and indicated their desired size using the image distortion method described in Section 2 of this Chapter. The subjects then experienced a mood induction procedure.

The mood induction procedure

The mood induction procedure (MIP) began with subjects indicating their current level of mood on a visual analogue scale (Appendix 25). Following this, subjects were told that they were to view a series of cards displaying written statements and that they were to try very hard to capture the mood of the statements. The difficult nature of the task was emphasised and subjects were encouraged to try hard to succeed.

Subjects were then unknowingly assigned to a low mood or control group (in counterbalanced order). The experimenter presented 25 cards individually for the duration of 10 seconds each. Subjects in the low mood group viewed the cards with miserable connotations; and subjects in the

¹ These women are also reported in Chapter 2.

control group viewed cards with pleasant connotations. After trying to capture the mood of the statements subjects completed five open-ended self-referent statements. The low mood group completed statements with negative connotations, eg. *I feel a failure because....*; and the control group completed statements with positive connotations, eg. *I feel a success because....* The complete sets of open-ended statements are presented in Appendix 26. This additional method of mood induction was devised specifically for this study.²

Immediately following the MIP, subjects completed a second visual analogue scale identical to the first, indicating their current level of mood.

The second assessment

After the MIP subjects again estimated their body size and indicated their desired size, and the height and weight of subjects were recorded. Finally, subjects completed two assessments of concern with body shape:

- (1) A four-point rating scale measuring the importance of being slim (Appendix 7);
- (2) The Body Shape Questionnaire or BSQ (see Chapter 2).

Confidentiality was stressed throughout the experiment, and responses were anonymous. Standardised instructions were used.

Results

Subjects

Eighty-two students from the total sample of 85 successfully completed the experiment. Three were excluded from data analyses: one because of a technical problem with the body size estimation apparatus; one subject was unable to complete the procedure due to a broken arm; and one subject refused to wear a leotard in order to estimate her body size. Forty-one subjects remained in the low mood group, and 41 in the control group.

Changes in mood

Table 4.2.1 shows that the MIP had the desired effect on mood, as measured by the visual analogue scales. At the first assessment the two groups showed similar levels of mood. The low mood group was significantly more depressed after the MIP compared with before; and after the MIP was significantly more depressed than the control group. The control group also showed a significant change in mood and was less depressed after the MIP compared with before.

² Emphasising negative self-depreciatory statements seemed particularly relevant, given the self-depreciatory thoughts which typically accompany depressed mood (Beck, 1973).

Table 4.3.1
Changes in mood

	Before the MIP \bar{X}/sd	After the MIP \bar{X}/sd	t	df	P
Low mood group (N=41)	2.35 2.13	4.59 2.43	6.75	40	.001
Control group (N=41)	2.73 2.51	1.88 2.34	4.39	40	.001
	Low mood Group (N=41) \bar{X}/sd	Control Group (N=41) \bar{X}/sd	t	df	P
Before MIP	2.35 2.13	2.73 2.51	0.75	80	>.05
After MIP	4.59 2.43	1.88 2.34	5.14	80	.001

Despite significant changes in mood, the MIP was not successful for all subjects. Four women in the low mood group did not report feeling more depressed following the MIP compared with before; and five women in the control group reported a slightly lower mood following the MIP. These subjects were excluded from subsequent analyses. Mood changes based on the remaining subjects are shown in Table 4.3.2, and are illustrated in Figure 4.3.1.

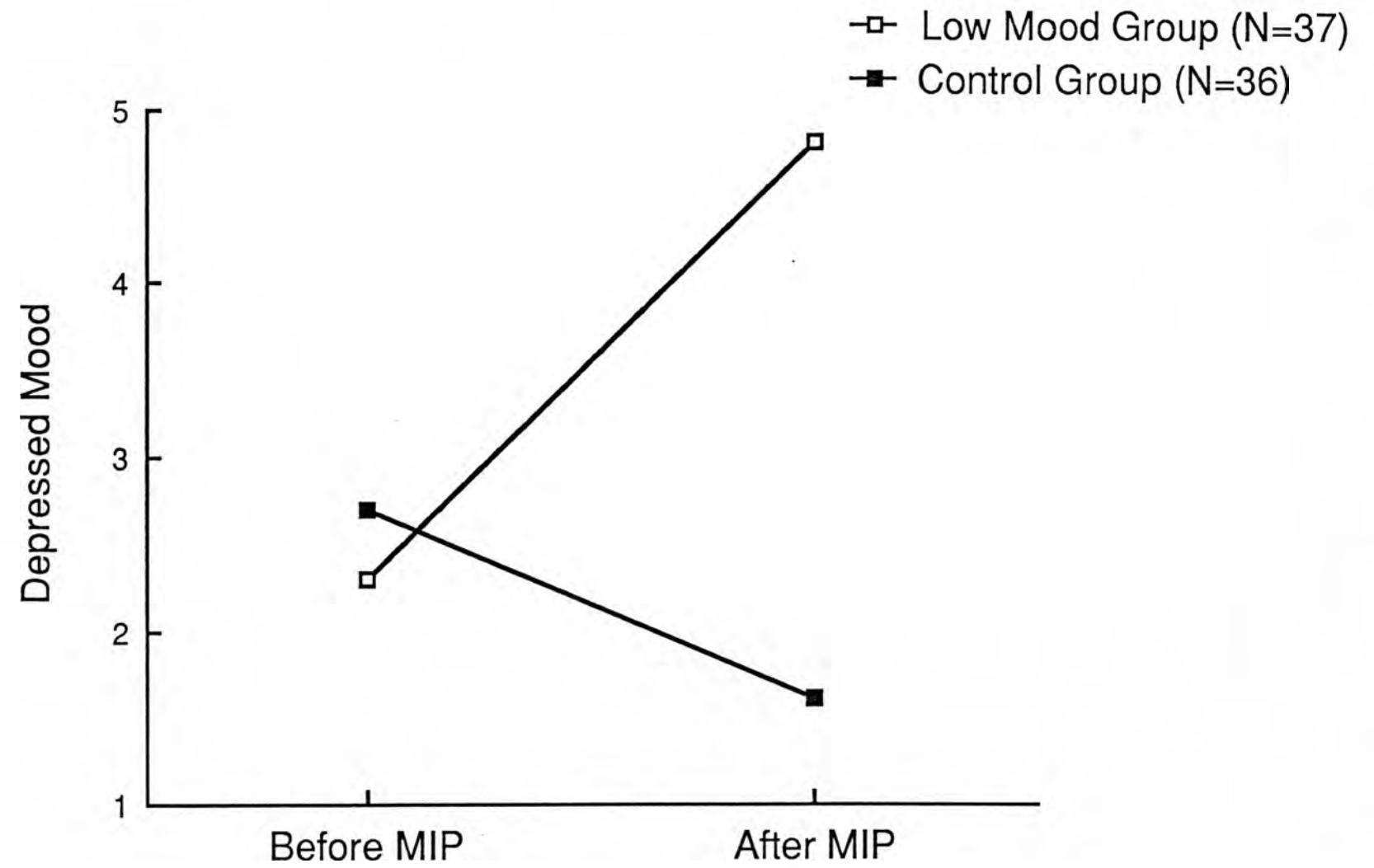


Figure 4.3.1
Changes in mood following the mood induction procedure (MIP)

Table 4.3.2
Change in mood: subjects for whom the MIP was successful

	Before MIP \bar{X}/sd	After MIP \bar{X}/sd	t	df	P
Low mood group (N=37)	2.29 2.16	4.79 2.41	7.32	36	.001
Control group (N=36)	2.71 2.47	1.64 2.06	5.65	35	.001
	Low mood Group (N=37)	Control Group (N=36)	t	df	P
Before MIP	2.29 2.16	2.71 2.47	0.78	71	>.05
After MIP	4.79 2.41	1.64 2.06	5.98	71	.001

Thus, the MIP successfully induced a low mood state among subjects in the low mood condition.

Group comparisons at the initial assessment

Table 4.3.3 shows that at the initial assessment the groups did not differ on demographic variables, mood and perception of body size, although the low mood group tended to overestimate their size somewhat more. All subjects rated being slim as at least *Slightly Important*; and the two groups considered being slim to be equally important ($\chi^2=2.33$, $df=2$, $P>.05$).

Table 4.3.3
Group differences before the mood induction procedure

	Low mood Group (N=37) \bar{X}/sd sd	Control Group (N=36) \bar{X}/sd sd	t	df	P
Age	19.9 1.1	20.0 1.1	0.32	71	>.05
MPMW	100.3 10.2	99.8 11.5	0.18	71	>.05
BDI	6.9 5.4	8.1 5.9	0.88	71	>.05
Perceived Size	107.1 16.5	103.2 12.1	1.13	71	>.05
Desired Size	91.2 10.8	90.7 12.4	0.19	71	>.05
Body size Dissatisfaction	15.9 13.4	12.6 14.6	1.01	71	>.05

Thus, before the MIP the two groups were similar on the measures taken.

Body size perception after the MIP

For the low mood group, perceived body size significantly increased following the induction of low mood ($t=3.43$, $df=36$, $P<.002$). For the control group body size perception also increased somewhat following the MIP ($t=2.08$, $df=35$, $P<.05$). Table 4.3.4 shows that, contrary to expectation, after the MIP the low mood group did not overestimate their size significantly more compared with the control group. A measure of change in perceived size was derived by subtracting perceived size before the MIP from perceived size after the MIP. Table 4.3.4 shows that, although the low mood group showed a greater increase in perceived size compared with the control group, the size of the increase was not significantly different between the two groups. Changes in perceived size for the two groups are illustrated in Figure 4.3.2.

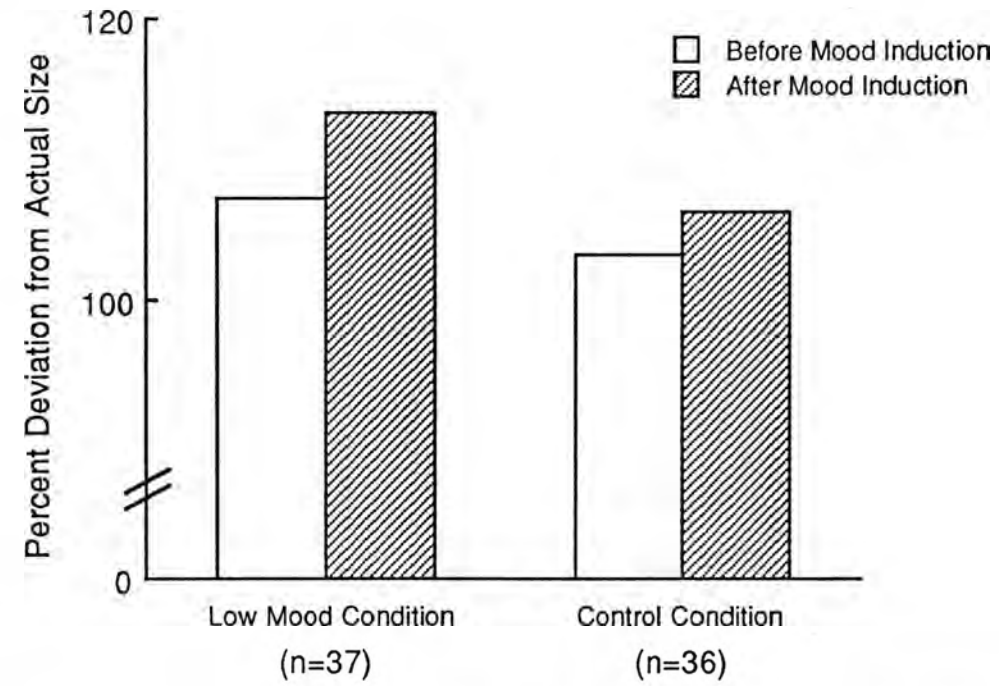


Figure 4.3.2
Change in perceived size following the mood induction procedure

For body size dissatisfaction the results were as predicted. Subjects in the low mood group were more dissatisfied with their body size after the MIP compared with before ($t=3.19$, $df=36$, $P<.003$); and subjects in the control group were equally dissatisfied before and after the MIP ($t=0.08$, $df=35$, $P>.05$). Table 4.3.4 shows that following the MIP the low mood group was significantly more dissatisfied with their body size compared with the control group. A measure of change in body size dissatisfaction was derived by subtracting dissatisfaction before the MIP from dissatisfaction after the MIP. Table 4.3.4 shows that body size dissatisfaction increased significantly more for the low mood group compared with the control group. Changes in body size dissatisfaction for the two groups are illustrated in Figure 4.3.3.

The desired size of the low mood group was unaffected by the MIP ($t=0.26$, $df=36$, $P>.05$), as predicted. In contrast, the desired size of the control group significantly increased following mood elevation ($t=2.60$, $df=35$, $P<.02$). Table 4.3.4 shows that although the desired size of the two groups was not significantly different after the MIP, the control group showed a significantly greater increase in their desired size. Changes in desired size are illustrated in figure 4.3.4.

Table 4.3.4
Group differences after the mood induction procedure

	Low mood Group (N=37) \bar{x}/sd	Control Group (N=36) \bar{x}/sd	t	df	P
Perceived Size	113.3 22.7	106.2 15.0	1.58	62.6	>.05
Change in Perceived size	6.2 11.0	3.0 8.5	1.41	71	>.05
Desired size	90.9 12.0	93.5 14.1	0.83	71	>.05
Change in Desired Size	-.26 6.14	2.82 6.50	2.08	71	.05
Body size Dissatisfaction	22.36 20.12	12.70 16.31	2.25	71	.03
Change in Dissatisfaction	6.48 12.37	0.14 10.03	2.40	71	.02

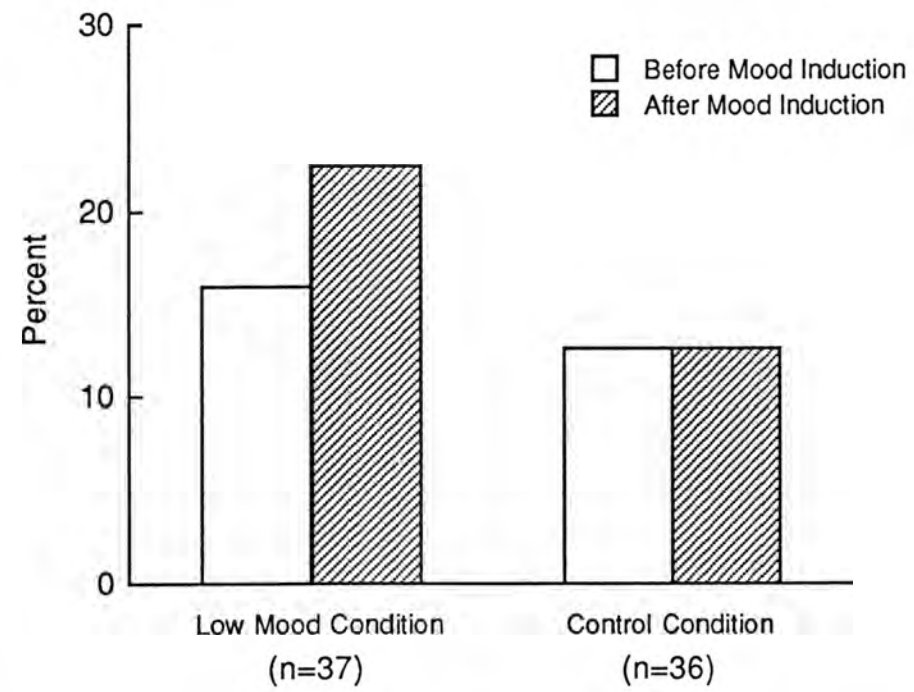


Figure 4.3.3
Change in body size dissatisfaction following the mood induction procedure

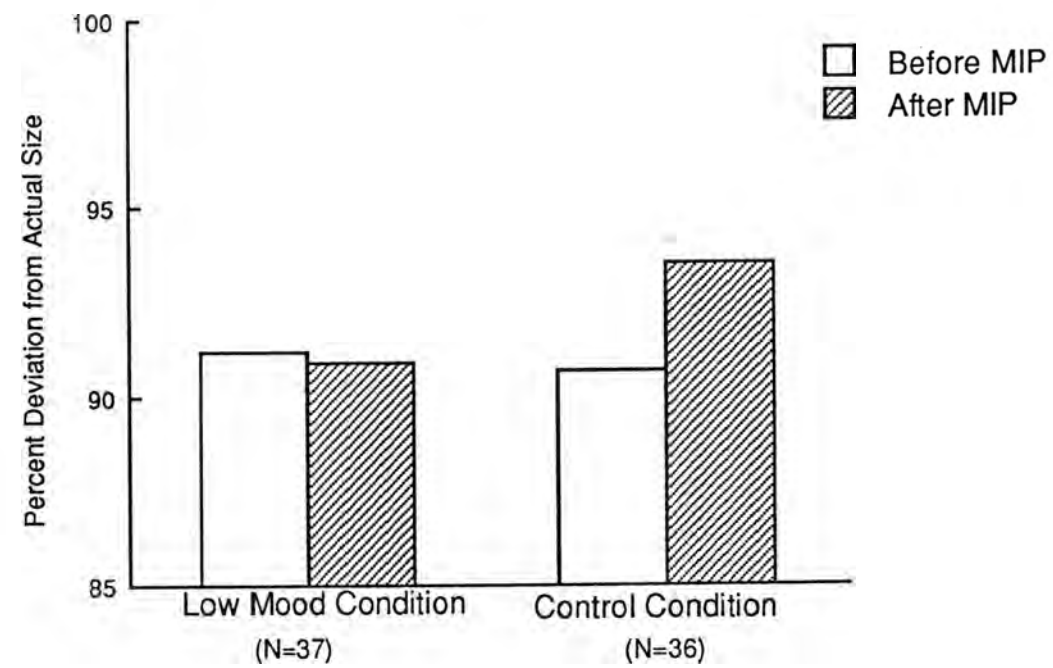


Figure 4.3.4
Change in desired size following the mood induction procedure

Thus, compared with the control group, after the MIP the low mood group tended to overestimate their size more and tended to show a greater increase in body size overestimation; and were significantly more dissatisfied with their body size and showed a significantly greater increase in body size dissatisfaction.

Concern with body shape

The data were then examined in relation to concern with shape as measured by the BSQ. Subjects in the low mood group were divided into those who showed *No Concern* (ie. BSQ ≤ 80 ; N=19), and those who showed at least *Mild Concern* (ie. BSQ > 80 ; N=18), based on the categorisation described in Chapter 2. Table 4.3.5 shows that these two groups which differed in their level of concern with their shape showed similar estimations of perceived size, desired size and body size dissatisfaction before and after the MIP. However, the group with higher concern with their shape showed a significantly greater increase in perceived size, tended to show a greater increase in desired size, and showed a non-significantly greater increase in body size dissatisfaction. Changes in perceived size and body size dissatisfaction are illustrated in Figures 4.3.5 and 4.3.6.

Table 4.3.5
Body size perception in relation to concern with body shape

	No Concern (N=19)	≥Mild Concern (N=18)	t	df	P
Age	19.9 1.2	19.9 1.0	0.16	35	>.05
MPMW	96.7 11.4	104.1 7.2	2.33	35	.03
BSQ	62.9 14.3	106.8 19.0	7.96	35	.001
BDI	6.3 6.3	7.6 4.4	0.72	35	>.05
Perceived Size Before MIP	106.2 16.5	108.0 16.9	0.33	35	>.05
Perceived Size After MIP	108.2 22.3	118.7 22.3	1.43	35	>.05
Change in Perceived size	2.0 10.4	10.7 10.1	2.59	35	.014
Desired Size Before MIP	92.9 9.3	89.4 12.2	0.96	35	>.05
Desired Size After MIP	90.9 12.3	90.9 12.0	0.001	35	>.05
Change in Desired Size	-1.9 5.8	1.5 6.2	1.76	35	<.09
Dissatisfaction Before MIP	13.3 14.5	18.6 11.9	1.20	35	>.05
Dissatisfaction After MIP	17.3 21.4	27.8 17.6	1.62	35	>.05
Change in Dissatisfaction	3.9 13.1	9.2 11.3	1.30	35	>.05

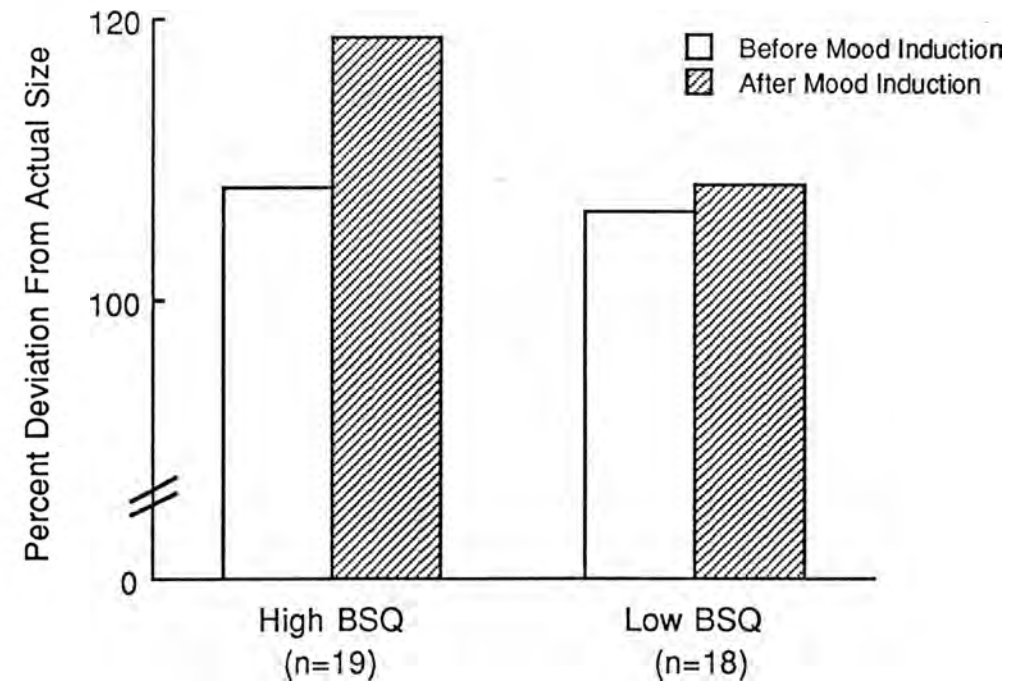


Figure 4.3.5
Change in perceived size in relation to concern with shape
following the induction of low mood

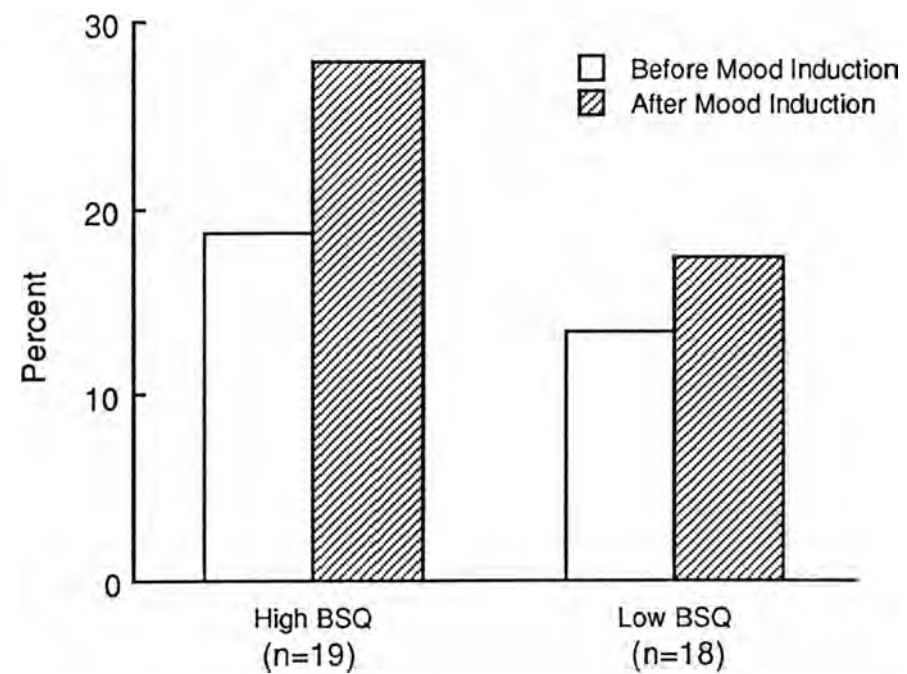


Figure 4.3.6
Change in body size dissatisfaction in relation to concern with shape
following the induction of low mood

Thus, compared with subjects with no concern with their shape, among subjects who were concerned, the induction of low mood had a greater effect on body size perception. However, Table 4.3.5 shows that the high BSQ group weighed significantly more than the low BSQ group. This was because weight was significantly related to the BSQ ($r=.37$, $P<.001$). Weight was also related to perceived size ($r=.25$, $P<.02$) and body size dissatisfaction ($r=.33$, $P<.001$), but was unrelated to desired size ($r=-.09$, $P>.05$). It was therefore possible that subjects in the high BSQ group showed a greater increase in body size overestimation and tended to show a greater increase in body size dissatisfaction because they weighed more and not because they showed greater concern with their shape. Two further analyses showed that this was not the case. First, weight was unrelated to changes in perceived size ($r=.07$, $P>.05$) and body size dissatisfaction ($r=.09$, $P>.05$). Second, Table 4.3.6 shows that controlling for differences in weight using analysis of covariance, subjects in the high BSQ group still showed a significantly greater increase in perceived size, and still tended to show a greater increase in body size dissatisfaction.

Table 4.3.6
Changes in body size perception in relation to concern with shape,
Controlling for weight

	No Concern Adjusted \bar{X} (N=19)	\geq Mild Concern Adjusted \bar{X} (N=18)	F	df	P
Change in Perceived size	2.1	10.5	5.24	1,34	<.03
Change in Body size Dissatisfaction	5.0	8.1	0.53	1,34	>.05

Thus, compared with subjects who showed no concern with their shape, for subjects who showed at least mild concern, low mood led to a significantly greater increase in body size overestimation and tended to lead to a greater increase in body size dissatisfaction.

Discussion

This study tested the hypothesis that negative self-evaluation as a symptom of depressed mood may lead to body size overestimation and body size dissatisfaction. A group of normal young women estimated their body size before and after a mood induction procedure (MIP). The MIP was effective in that mood was lowered or elevated for the majority of subjects. Subjects in the

low mood condition reported feeling more despondent after the MIP compared with before; and after the MIP felt significantly more despondent than subjects in the control condition. Subjects in the control group reported a more positive mood after the MIP compared with before, which was unexpected since the procedure was not designed to change their mood. Pleasant cards and statements were used in preference to neutral ones to minimize the possibility of subjects in the control condition growing bored during the MIP, which in turn may have induced a negative mood.

As predicted, perceived body size increased following the induction of low mood. This finding was not simply a function of response expectation ie. for subjects in the low mood group perceived body size did not increase simply because these subjects expected to see themselves as larger, since perceived size also increased for subjects in the control group. The latter finding was unexpected, and suggests that estimations increased to some extent simply as a function of re-testing. Compared with the control group, subjects in the low mood group tended to show a greater increase in perceived size, which was consistent with the hypothesis that body size overestimation may arise as one manifestation of general self-depreciation. However, compared with the control group, the low mood group did not show a significantly greater increase in perceived size, and this lack of statistical significance may have been because the low mood group overestimated their size more before the MIP. This greater overestimation meant that there was less potential within the constraints of the level of distortion produced by the equipment for their estimations to increase. Alternatively, the lack of statistical significance may have been due to the large range in estimations which was at least partly attributable to problems with the method used to measure body size perception (discussed in Appendix 23).

The prediction that body size dissatisfaction would increase with depressed mood was supported. Dissatisfaction significantly increased following the induction of low mood, but was unchanged by the induction of a positive mood. These findings supported the hypothesis that the feelings of self-depreciation which typically accompany depressed mood may focus on perception of body size and exacerbate body size dissatisfaction.

Desired size was unaffected by the induction of low mood, as was predicted; but inducing a positive mood unexpectedly led to an increase in desired size. This suggests that desired size may increase but not decrease in relation to base-line level of mood. Before the MIP 78 percent of the women wished to be slimmer than their perceived size. Feeling miserable did not change this desire, but did not create a desire to be even thinner. The increase in desired size which accompanied the positive mood state suggests that when a woman feels happy a slim shape may be less important than during a neutral or negative mood state.

Changes in body size perception in relation to concern with shape provided partial support for the prediction that the extent of change in body size perception following low mood would be related to the level of concern with shape. Following the induction of low mood, compared with women who showed no concern with their shape, those who showed at least mild concern

showed a greater increase in perceived size and tended to show a greater increase in body size dissatisfaction, as predicted. However, contrary to prediction, compared with the group with no concern with their shape, after the MIP the mild concern group did not overestimate their body size more and were not more dissatisfied with their size. It is possible that the level of concern with shape shown by the mild concern group was insufficient to significantly affect body size perception during a low mood. It had been hoped to induce a negative mood state among subjects with very high or very low levels of concern with their shape and compare changes in body size perception. However, it was not possible to match subjects who showed markedly different levels of concern with shape on initial level of mood, perceived size and body size dissatisfaction. This was due to the association between concern with shape and these factors as described in Section 2 of this Chapter. Therefore, in view of initial group differences in mood and body size perception, it would be difficult to interpret the effect of mood on body size perception in relation to differences in concern with shape. Although one weakness of the present study was that the high and low concern groups did not markedly differ on the level of concern, one strength of the study was that the two groups were similar in level of depression and body size perception before the MIP.

The associations between change in mood and change in body size perception were studied under artificial conditions and conclusions based on the findings must therefore be regarded as tentative. The changes in mood were not great. Nevertheless, since changes in body size perception were observed in relation to small changes in mood it would appear that the association between body size perception and mood is quite robust.

To conclude, findings from this study provided partial support for the hypothesis that depressed mood may exacerbate disturbances in body size perception, particularly among women for whom shape is important. Compared with a positive mood state, low mood tended to lead to greater body size overestimation and led to greater body size dissatisfaction; and compared with subjects who showed no concern with their shape, low mood had a greater effect on body size perception among subjects who were concerned with their shape. The findings from this mood induction study based on women in the community have important implications for disturbances in body size perception found among patients with eating disorders. It is possible that the depressive symptoms which characterise these patients (Eckert et al,1982; Cooper and Fairburn,1986) may exacerbate the disturbances in body size perception which have been reported among these patients. Furthermore, the improvement in mood which has been found to accompany an improvement in disturbed eating behaviour during treatment for an eating disorder (Eckert et al,1982; Fairburn et al,1985) may be associated with an improvement in disturbances in body size perception. The suggestion that changes in mood and changes in body size perception may be associated among patients with eating disorders must be regarded as tentative, since it is possible that the mechanisms which give rise to disturbances in body size perception may be different for women in the community and women with eating disorders.

Chapter 5

Body Image Disturbance In Bulimia Nervosa

Section 1

Concern with shape in bulimia nervosa

Introduction

A disturbance in body image has often been discussed in relation to the eating disorder bulimia nervosa (eg. Birchnell et al,1985; Touyz et al,1985; Whitehouse et al,1986), as was discussed in Chapter 1. It has been suggested that these patients' concerns with their shape and weight are perhaps the most striking feature of the disorder (Fairburn et al,1986a), implying that such concerns are more distinctive than the characteristically disturbed eating behaviour. These concerns have often been labelled *overvalued ideas about shape and weight* (eg. Fairburn et al,1986a). Fairburn and his colleagues have suggested that among patients with bulimia nervosa thinness is regarded as highly attractive and desirable, and fatness is viewed as odious and reprehensible. They argue that such attitudes determine a patient's evaluation of herself, and shape becomes a measure of self-worth. Clearly, these attitudes are not dissimilar to widely held views. Nevertheless, they are extreme and dysfunctional.

Excessive concerns about shape appear to affect those with bulimia nervosa to a considerable extent. On the basis of clinical interviews with patients with bulimia nervosa, Fairburn and his colleagues (Fairburn et al,1986a) have suggested that the specific concerns about shape typically found among these patients focus on the appearance of the patients' stomach, hips, bottom and thighs. Some assess their shape on the basis of the tightness of their clothes, some scrutinize themselves in mirrors, and a minority measure parts of their body. Indeed, some find their appearance so unsightly and distressing that they shun any situation where they might see themselves, by undressing in the dark, bathing while wearing clothes, and avoiding communal changing rooms and swimming pools. Many are highly sensitive towards small changes in their shape.

Despite the suggested importance of shape among patients with bulimia nervosa, there have been surprisingly few studies of this concern. Using the *Body Dissatisfaction* subscale of the EDI (Garner et al,1983) several reports examined dissatisfaction with specific body parts among patients with bulimia (eg. Garner et al,1985; Whitehouse et al,1986; Willmuth et al,1985; Wooley and Kearney-Cooke,1986). Only one study (Whitehouse et al,1986) appears to have compared the level of dissatisfaction shown by these patients with that shown by normal young women, and found that the patients were significantly more dissatisfied with their body. One other study (Garner et al,1985) compared the level of dissatisfaction shown by patients with bulimia with that shown by patients with anorexia nervosa, and found that the patients with bulimia were significantly more dissatisfied. Thus, it would seem that despite the majority being of normal weight (Fairburn and Cooper,1984a), patients with bulimia nervosa may be highly dissatisfied

with their body shape. However, findings from reports of body dissatisfaction among patients with bulimia are limited in that the studies did not assess aspects of concern with shape aside from body part dissatisfaction. Although such dissatisfaction is undoubtedly an important aspect of concern with shape, it is one of many aspects (as was discussed in Chapter 2).

Only one study has attempted to examine attitudes towards shape aside from body part dissatisfaction among patients with bulimia nervosa (Fairburn and Cooper, 1984a). Using a semi-structured clinical interview, Fairburn and Cooper reported that most patients with bulimia nervosa showed an extreme fear of becoming fat, the majority showed an extreme degree of sensitivity towards weight gain, but few showed an extreme pursuit of thinness or marked body shape disparagement. However, similar to studies of body dissatisfaction, this study also had its limitations. A standardised validated measure of concern with shape was not used, and concern with shape was assessed together with many other clinical features of the disorder and was therefore not comprehensively examined in detail.

The dearth of research into concern with shape among patients with bulimia nervosa is probably at least partly because there has been no satisfactory measure of this concern. In Chapter 2 the development of a new measure of concern with shape was reported. It was found that although many women show some concern with their shape, most patients with bulimia nervosa show an extreme level of concern which is much greater than that shown by most women in the community. This finding confirmed the suggestion raised by other studies that patients with bulimia nervosa are indeed highly sensitive about their shape, and that this concern encompasses much more than simply dissatisfaction with specific body parts.

Perhaps the greatest limitation of the published studies of concern with shape in patients with bulimia or bulimia nervosa is that the authors did not question the clinical significance of this concern in terms of its relationship with other indices of disturbance. This is an important omission for two main reasons. First, an extreme level of concern with shape would appear to indicate a high level of distress in the sufferer, and it is therefore worthwhile to evaluate the nature of this distress. Second, it has been suggested that attitudes towards shape and weight may be important in the maintenance of bulimia nervosa (Fairburn et al, 1986a). Given that shape is highly important, then the characteristic symptoms of the disorder become understandable, such as frequent weighing, extreme dieting, excessive exercise, self-induced vomiting and laxative abuse. Even the apparently paradoxical bulimic episodes become understandable since there is evidence that dietary restraint may precipitate overeating (Herman and Mack, 1975).

The aim of the present study was to examine the significance of concern with shape among patients with bulimia nervosa, by investigating relationships between these patients' scores on the BSQ with demographic factors, eating behaviour and the specific and general psychopathological disturbance which characterise these patients.

Method

Patients

Patients were consecutive referrals to two outpatient eating disorder clinics in Oxford and Cambridge (ie. 39 in Oxford and 33 in Cambridge) between October 1985 and March 1987.¹ Patients were included in the study if they satisfied Russell's (1979) criteria for bulimia nervosa or DSM III-R (American Psychiatric Association, 1987) criteria for bulimic disorder (Appendix 2).²

Assessments

Patients completed the Body Shape Questionnaire or BSQ (see Chapter 2) and a number of other measures as part of a standardised assessment.

- (1) Demographic features and eating and weight history were examined using a standardised clinical interview (Cooper and Cooper, 1986)
- (2) Disturbed eating behaviour and weight control measures were assessed using items 16, 26, 30 and 34 of the Eating Disorder Examination or EDE (Cooper and Fairburn, 1987), ie. questions concerning frequency over the past month of bingeing, vomiting, laxative abuse and exercise specifically for weight and shape. The EDE (described in Chapter 2) is a semi-structured clinical interview and requires the rating of responses to 62 questions specifically associated with the eating disorders.
- (3) Psychopathological disturbance specifically associated with the eating disorder was assessed using the following measures:
 - (a) The Eating Attitudes Test or EAT (Garner and Garfinkel, 1979), which is a 40-item questionnaire measuring disturbed eating attitudes and behaviour. A high score indicates a high level of disturbance.
 - (b) The Eating Disorder Inventory or EDI (Garner et al, 1983), which is a 64-item questionnaire measuring attitudes and behaviour commonly found among patients with anorexia nervosa and bulimia. The EDI has eight subscales, and a high score on each indicates a high level of disturbance:

¹ 38 of these patients were used in the validation of the BSQ for eliminating repetitive items and for comparisons between groups, as reported in Chapter 2. A comparison between these 38 patients and the remaining 34 on all measures used in subsequent analyses in this study revealed no differences. Therefore, it was considered legitimate to include the 38 patients in the current analyses.

² A diagnosis was made on the basis of a clinical interview by the assessing clinician. The only area of uncertainty within Russell's diagnostic criteria concerns the 'morbid fear of fatness'. It has recently been suggested (Fairburn, in press) that an operational criterion be used for this fear, where shape or weight are one of the main measures of self-evaluation. In the current study all patients scored a rating of at least 4 on questions 44 or 50 of the Eating Disorder Examination (Cooper and Fairburn, 1987), ie. questions concerning the importance of weight and shape. Thus, for all patients, shape or weight or both were one of the main aspects of self-evaluation.

- (i) *Drive for Thinness*, which measures a strong desire to lose weight, a fear of weight gain and excessive dieting;
 - (ii) *Bulimia*, which measures bingeing and vomiting behaviour;
 - (iii) *Body Dissatisfaction*, which measures the belief that specific body parts associated with shape changes or increased *fatness* at puberty are too large;
 - (iv) *Ineffectiveness*, which measures feelings of inadequacy, insecurity and worthlessness;
 - (v) *Perfectionism*, which measures excessive personal expectations for superior achievement;
 - (vi) *Interpersonal Distrust*, which measures a sense of alienation and a reluctance to form close relationships;
 - (vii) *Interoceptive Awareness*, which measures lack of confidence in recognising and identifying emotions and sensations of hunger and satiety;
 - (viii) *Maturity Fears*, which measures a desire to retreat to the security of preadolescent years due to the overwhelming demands of adulthood.
- (c) The Three Factor Eating Questionnaire (Stunkard and Messick, 1985), which is a 51-item questionnaire with three factors measuring eating behaviour:
- (i) *Dietary Restraint*, which measures cognitive control over eating;
 - (ii) *Disinhibition*, which measures disinhibition of control over eating;
 - (iii) *Hunger*, which measures susceptibility to hunger.

A high score on each subscale indicates a high level of disturbance.

- (4) Psychopathological disturbance not specifically associated with the eating disorder was assessed using the following measures:
- (a) The Beck Depression Inventory or BDI (Beck et al, 1961), which is a 21-item questionnaire measuring level of depression, where a high score indicates a high level. All patients with eating disorders reported in this thesis received a modified version of the BDI. The original questionnaire was shortened from 21 to 18 items by omitting questions 14, 18 and 19. These questions are concerned with appetite, appearance and weight. Patients often become confused when trying to answer them. Furthermore, patients commonly endorse these questions in relation to disturbances associated with the eating disorder and not in relation to mood. Therefore, high scores on these questions may give a misleading indication that patients show a high level of depression. Thus, all patients completed the 18-item version of the BDI.

- (b) The Rosenberg Self-Esteem Scale (Rosenberg,1965), which is a 10-item questionnaire measuring self-esteem. A low score indicates a poor evaluation of self-worth.
- (c) The Modified Social Adjustment Scale (Cooper et al,1982), which is a self-report questionnaire measuring social functioning. This questionnaire has ten subscales and completion of each is optional. Respondents answer only the subscales relevant to their lives, eg. married life and/or student life. A measure of general level of social adjustment is derived by taking the mean of all subscales. A high score indicates a poor level of social adjustment.

Since completion of each subscale is optional, the number of patients who endorsed each subscale was small. Therefore, only the overall index of social adjustment is reported in data analysis.

- (d) The Symptom Check List-90 or SCL-90 (Derogatis et al,1973), which is a 90-item questionnaire measuring symptoms typically found among psychiatric outpatients. The measure has nine subscales: namely, *Somatization*, *Obsessive-Compulsive*, *Interpersonal Sensitivity*, *Depression*, *Anxiety*, *Hostility*, *Phobic Anxiety*, *Paranoid Ideation* and *Psychoticism*. This measure also has a global index of psychiatric symptoms, the *Global Severity Index*. The SCL-90 was described in detail in Section 5 of Chapter 3.

For all patients with bulimia nervosa reported in this thesis, the SCL-90 was modified by omitting items 19, 60 and 73. These items measure disturbed eating behaviour, and nearly all patients with eating disorders score highly on them. Since the questionnaire was used as a measure of general psychopathological disturbance, high scores on these three questions may provide a misleading indication of a high level of general disturbance. Therefore, patients with bulimia nervosa were not asked to complete these three questions.

Results

Patients

All 72 patients who satisfied criteria for inclusion in the study were female and none currently suffered from anorexia nervosa. Demographic information and the clinical features for this patient sample are reported in Tables 5.1.1 to 5.1.4.

Table 5.1.1
Demographic information and weight history

	N	% of sample	Mean	sd
Age			23.0	4.6
MPMW			102.4	14.7
Desired MPMW			88.1	5.8
Weight				
Dissatisfaction				
lb			23.4	19.1
%			13.8	11.3
Highest MPMW			117.9	19.6
History of				
Obesity ¹				
No history	41	57.7		
History	30	42.3		
Lowest MPMW			83.7	12.3
History of				
Anorexia Nervosa				
No History	38	52.8		
Broad Criteria	34	47.2		
Narrow Criteria	18	25.0		

¹ The information for one patient is missing

Table 5.1.2
Eating behaviour and weight control measures for the patients with
Bulimia nervosa (N=72)

	N	% of sample	Mean	sd
Duration of Bingeing/years			4.0	3.3
≤year	18	25		
> year < 5 years	36	50		
≥5 years	18	25		
Frequency of Bingeing ¹			28.7	31.6
< daily	43	59.7		
≥daily	29	40.3		
Frequency of Vomiting ¹			40.5	90.4
None	17	23.6		
< daily	27	37.5		
≥daily	28	38.9		
Frequency of Laxative Abuse ¹			5.9	11.5
None	47	65.3		
< daily	19	26.4		
≥daily	6	8.3		
Exercise ^{1,2}				
None	35	49.3		
< daily	35	49.3		
≥daily	1	1.4		

1 Frequency over past month

2 The information for one patient is missing

Table 5.1.3
Psychopathological disturbance specifically associated with the
Eating disorder

	\bar{x}	sd
BSQ	138.5	27.3
EAT	47.4	15.1
EDI		
Drive for Thinness	14.6	4.9
Bulimia	10.6	4.6
Body Dissatisfaction	20.1	7.4
Ineffectiveness	11.9	6.9
Perfectionism	6.2	4.5
Interpersonal Distrust	6.4	5.0
Interceptive Awareness	11.1	6.4
Maturity Fears	4.0	4.4
Three Factor		
Eating Questionnaire		
Dietary Restraint	13.1	4.7
Disinhibition	13.0	2.5
Perceived Hunger	6.8	3.9

Table 5.1.4
Non-specific psychopathological disturbance

	\bar{x}	sd
BDI	21.5	9.7
Self-Esteem	21.0	4.3
Social Adjustment	2.50	0.42
SCL-90		
Somatization	1.09	0.76
Obsessive-Compulsive	1.46	0.82
Interpersonal Sensitivity	1.98	0.90
Depression	2.04	0.87
Anxiety	1.29	0.75
Hostility	1.18	0.84
Phobic Anxiety	0.64	0.71
Paranoid Ideation	1.19	0.84
Psychoticism	1.01	0.68
Global Severity Index	1.37	0.63

Age, weight history and history of anorexia nervosa

Age was unrelated to score on the BSQ ($r=-.09$, $P>.05$). Since the patients were of similar age, this lack of association may have been due to the little variability in age.

A high current body weight was associated with a high BSQ score ($r=.21$, $P<.04$). Table 5.1.5 compares patients who were underweight with those who were of average or above average weight. Using Scheffe's multiple range test, those who were underweight scored significantly lower on the BSQ. Thus, a low body weight was associated with a low level of concern with shape.

Table 5.1.5
Score on the BSQ in relation to current body weight

	% MPMW			F	df	P
	< 90 (N=13)	90-110 (N=41)	> 110 (N=18)			
BSQ	116.0*	143.4	143.6	6.19	2,69	.01
sd	32.2	25.5	19.3			

* Significantly different from other groups (Scheffe's multiple range test: $P<.05$)

Score on the BSQ was unrelated to desired weight ($r=.11$, $P>.05$), but a high score was associated with a high level of dissatisfaction with weight (ie. current MPMW minus desired MPMW) ($r=.28$, $P<.02$). Indeed, dissatisfaction with weight was a stronger predictor of score on the BSQ than current weight. It was not possible to examine the independence of the relationship between weight dissatisfaction and the BSQ controlling for current weight, since weight dissatisfaction was in part derived from current weight.

The relationship between a history of a high body weight and score on the BSQ was examined in two ways. First, highest weight since puberty was significantly associated with a high BSQ score ($r=.25$, $P<.02$). However, a history of a high weight was also associated with a high current weight ($r=.67$, $P<.001$); and the relationship between the score on the BSQ and highest weight was mediated by current weight. Controlling for current weight, a history of a high weight was no longer significantly associated with a high BSQ score (Partial $r=-.07$, $P>.05$). Second, in Table 5.1.6 patients with a history of obesity (ie. previous MPMW $\geq 120\%$) are compared with those with no such history. Those with a history of obesity scored significantly higher on the BSQ. However, Table 5.1.6 shows that those with a history of obesity weighed significantly more, and the relationship between a history of obesity and a particularly high BSQ score was not independent of current weight. Using analysis of covariance to control for current weight, patients with a history of obesity scored similarly on the BSQ compared with patients with no such history (adjusted means=142.7 versus 134.9; $F=1.17$, $df=1,68$, $P>.05$).

Table 5.1.6
The relationship between a history of obesity and concern with shape

	History of obesity (N=31) \bar{X}/sd	No History of obesity (N=41) \bar{X}/sd	F	df	P
BSQ	145.7 22.8	133.1 29.3	3.95	1,70	.05
MPMW	110.4 17.0	96.6 9.3	19.3	1,69	.001

A history of a low body weight was associated with a low level of concern with shape in that lowest weight since puberty was associated with a low score on the BSQ ($r=.25$, $P<.02$). However, a history of low weight was also associated with a low current weight ($r=.60$, $P<.001$); and controlling for the relationship between current weight and the BSQ, a history of low weight

was no longer significantly associated with a low BSQ score (Partial $r=.17$, $P>.05$).

A history of anorexia nervosa was then examined in relation to current level of concern with shape, by comparing patients with a history of anorexia nervosa with those with no such history. A history of anorexia nervosa was defined in two ways:

- (i) A previous body weight of less than 75 percent of average weight (matched for age, height and sex), plus concurrent amenorrhoea, plus a morbid fear of fatness, ie. *narrow* criteria.
- (ii) A previous body weight of less than 85 percent of average weight, plus concurrent amenorrhoea, plus a morbid fear of fatness, ie. *broad* criteria.

Table 5.1.7 shows that patients with a history of anorexia nervosa using the narrow criteria showed a similar level of concern with shape compared with patients with no history of the disorder.

Table 5.1.7
The relationship between a history of anorexia nervosa (narrow criteria)
and concern with shape

	History (N=18) \bar{x}/sd	No History (N=54) \bar{x}/sd	t	df	P
BSQ	130.1 32.1	141.3 25.2	1.52	70	>.05
MPMW	94.8 10.1	104.9 15.2	2.56	69	.02

Table 5.1.7 also shows that patients with a history of anorexia using narrow criteria weighed significantly less than patients with no history of the disorder, and since a low weight was associated with a low BSQ score it is possible that those patients with a history of anorexia nervosa would have showed greater concern with their shape had they weighed more. Controlling for current weight using analysis of covariance, this was found to be not the case. Patients with a history of anorexia nervosa using the narrow criteria still scored similarly on the BSQ compared with patients with no history of the disorder even allowing for differences in current weight (adjusted means=128.4 versus 139.9 respectively; $F=2.23$, $df=1,68$, $P>.05$).

Patients with a history of anorexia nervosa using the broad criteria scored significantly lower on the BSQ compared with patients with no history of anorexia nervosa, as shown in Table 5.1.8. However, those with no history of anorexia nervosa using the broad criteria weighed significantly

less, and the relationship between a history of anorexia nervosa and a low BSQ score was mediated by current weight. Using analysis of covariance to control for differences in current weight, patients with and without a history of anorexia nervosa using the broad criteria scored similarly on the BSQ (adjusted means=131.4 versus 143.4 respectively; $F=3.12$, $df=1,68$, $P>.05$).

Table 5.1.8
The relationship between anorexia nervosa (broad criteria)
and concern with shape

	History (N=34) \bar{x}/sd	No History (N=38) \bar{x}/sd	t	df	P
BSQ	131.6 31.1	144.7 21.9	2.03	58.5	.05
MPMW	96.1 10.3	107.9 15.9	3.76	64.0	.001

Thus, allowing for current weight, a history of anorexia nervosa was unrelated to current concern with shape.

Eating behaviour and weight control measures

There was no linear association between duration of bingeing and score on the BSQ ($r=-.12$, $P>.05$). However, Table 5.1.9 shows that patients with a recent onset of bingeing scored significantly higher on the BSQ compared with patients with a longer history of binge eating. Table 5.1.9 also shows that the association between a recent onset of bulimic episodes and a high BSQ score was not mediated by current weight, since patients with a recent onset of binge eating were of similar weight compared with patients with a less recent onset.

Thus, concern with shape appears to be particularly high shortly after the onset of binge eating.

Table 5.1.9
The relationship between duration of bingeing and concern with shape

	≤1 Year (N=18) \bar{X}/sd	>1 Year ≤5 Years (N=36) \bar{X}/sd	>5 Years (N=18) \bar{X}/sd	F	df	P
BSQ	154.6* 21.2	133.0 28.0	133.4 25.9	4.62	2,69	.02
MPMW	104.5 12.3	102.0 16.4	101.2 14.0	0.26	2,68	>.05

* Significantly different from other groups (Scheffe's multiple range test: $P < .05$)

Frequency of bingeing was unrelated to score on the BSQ ($r = -.09$, $P > .05$); and patients who binged at least once every day scored similarly on the BSQ compared with patients who binged less often (BSQ=133.8, $sd=29.7$, $N=29$ versus BSQ=141.7, $sd=25.3$, $N=43$ respectively; $F=1.46$, $df=1,70$, $P > .05$). Since all patients experienced bulimic episodes and most showed a very high level of concern with their shape, there may have been insufficient variability on these factors for them to be related.

Frequency of self-induced vomiting was not significantly related to score on the BSQ ($r = -.15$, $P > .05$), and patients who vomited showed a similar level of concern with their shape compared with patients who did not vomit (BSQ=136.5, $sd=29.9$, $N=55$ versus BSQ=144.9, $sd=15.0$, $N=17$ respectively; $t=1.55$, $df=54.8$, $P > .05$).³ However, Table 5.1.10 shows that among patients who vomited, those who did so at least daily scored significantly lower on the BSQ compared with those who vomited less than daily. Table 5.1.10 also shows that these two groups were of similar weight. Thus, frequent vomiting was associated with a relatively low level of concern with shape, and this relationship was independent of current weight.⁴ Frequent vomiting was also associated with frequent bingeing ($r = .84$, $P < .001$).

³ The separate variance estimate of t is reported for this analysis instead of analysis of variance since the variance in BSQ scores between the two groups was significantly different ($F=3.96$, $P < .01$), and using analysis of variance the assumption of homogeneity of variance was not met (Cochran's $C=.80$, $P < .001$).

⁴ Differences in weight were examined since frequent vomiting has previously been associated with a low body weight (Fairburn and Cooper, 1984b).

Table 5.1.10
The relationship between vomiting and concern with shape

	< daily (N=27) \bar{x}/sd	\geq daily (N=28) \bar{x}/sd	F	df	P
BSQ	144.9 26.2	128.5 31.4	4.42	1,53	.04
MPMW	103.5 14.8	96.9 12.7	3.13	1,52	>.05

Frequent laxative abuse was associated with a high level of concern with shape ($r=.30$, $P<.01$), and this association was independent of current weight (Partial $r=.33$, $P<.01$). Table 5.1.11 shows that patients who used laxatives to control their weight and shape scored significantly higher on the BSQ compared with patients who did not abuse laxatives. Furthermore, the two groups were of similar weight, which indicates that it was not because they weighed more that patients who abused laxatives did not show greater concern with their shape.

Table 5.1.11
The relationship between laxative abuse and concern with shape

	Laxative Abuse (N=25) \bar{x}/sd	No Laxative Abuse (N=47) \bar{x}/sd	F	df	P
BSQ	147.4 27.3	133.8 26.3	4.30	1,70	.04
MPMW	101.7 10.3	102.9 16.7	0.10	1,69	>.05

Exercise specifically for weight and shape was unrelated to level of concern with shape as measured by the BSQ ($r=.03$, $P>.05$); and patients who exercised specifically for their weight and shape scored similarly on the BSQ compared with patients who took no such exercise (BSQ=139.4, $sd=31.9$, $N=37$ versus BSQ=137.5, $sd=21.7$, $N=35$ respectively; $F=0.08$, $df=1,70$,

$P > .05$). Since few patients used exercise to compensate for the fattening effects of overeating, and since most showed a very high level of concern with their shape, similar to bulimic episodes, there may have been insufficient variability on the measure of exercise and BSQ scores for them to be significantly related.

Thus, a high level of concern with shape was associated with a recent onset of binge eating, laxative abuse and infrequent vomiting, but was unrelated to frequency of bulimic episodes and exercise specifically for weight and shape.

Psychopathological disturbance specifically associated with the eating disorder

Table 5.1.12 shows the relationship between score on the BSQ and measures of disturbance specifically associated with the eating disorder. A high level of concern with shape was associated with disturbed eating attitudes and behaviour, a strong desire to lose weight and a fear of weight gain, dissatisfaction with body shape, feelings of inadequacy, personal expectations for superior achievement, difficulty forming close relationships, difficulty identifying hunger and satiety, and a desire to retreat to the security of preadolescent years. Similar to the lack of association between frequency of binge eating and the BSQ, the *Bulimia* subscale of the EDI was unrelated to the BSQ.

Table 5.1.12
Specific psychopathological disturbance related to the BSQ

	r	P
EAT	.50	.001
Dietary Restraint	.36	.02
Drive for Thinness	.72	.001
Body Dissatisfaction	.74	.001
Ineffectiveness	.42	.001
Perfectionism	.35	.002
Interpersonal Distrust	.44	.001
Interoceptive Awareness	.32	.01
Maturity Fears	.21	.05

Specific psychopathological disturbance unrelated to the BSQ

Bulimia	.14	>.05
Disinhibition	.14	>.05
Perceived Hunger	-.08	>.05

Thus, among patients with bulimia nervosa a high level of concern with shape was associated with a high level of disturbance on many of the features which characterise the eating disorders.

Non-specific psychopathology

Table 5.1.13 shows the relationship between score on the BSQ and measures of psychopathological disturbances not specifically associated with the eating disorder. A high level of concern with shape was associated with depressed mood, low self-esteem, poor social adjustment, and a number of other indices of psychiatric disturbance as measured by the SCL-90, including feelings of self-deprecation.

Table 5.1.13
Non-specific psychopathology related to the BSQ

	r	P
BDI	.44	.001
Self-Esteem	-.52	.001
Social Adjustment	.45	.001
Somatization	.30	.01
Obsessive-Compulsive Symptoms	.37	.001
Interpersonal Sensitivity	.59	.001
Depressed Mood	.43	.001
Anxiety	.26	.02
Hostility	.24	.03
Paranoid Ideation	.48	.001
Psychoticism	.47	.001
Global Severity Index	.48	.001

Non-specific psychopathology unrelated to the BSQ

Phobic Anxiety	.19	>.05
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Thus, a high level of concern with shape was associated with a high level of general psychopathological disturbance.

Factors predicting a high BSQ score

Results so far indicated that indices of weight and weight history, behavioural disturbance associated with bulimia nervosa, and psychopathological disturbance specifically and non-specifically associated with the eating disorder predicted a high level of concern with shape. Many of these factors were inter-related (as shown in Appendix 27). Stepwise multiple linear regression analysis was used to examine the independence of these relationships and to identify

combinations of factors which produced the best prediction of a high level of concern with shape.

In the first regression analysis the indices of weight, weight history and history of anorexia nervosa significantly related to the BSQ ($P < .05$) were entered into a regression equation: namely, current weight, dissatisfaction with weight, highest weight, lowest weight, and a history of anorexia nervosa (broad criteria). Dissatisfaction with weight was the only factor to significantly predict a high BSQ score (Multiple $R = .28$, $F = 4.53$, $P < .04$), and the other factors did not significantly add to this prediction. Thus, among these indices, a high level of concern with shape was best predicted alone by marked dissatisfaction with weight.

In the second analysis the measures of disturbed eating behaviour and psychopathological disturbance specifically associated with the eating disorder which were significantly related to the BSQ ($P < .05$) were entered into a regression equation: namely, frequency of laxative abuse, score on the EAT, dietary restraint score; and the EDI subscales of *Drive for Thinness*, *Ineffectiveness*, *Perfectionism*, *Interpersonal Distrust*, *Interceptive Awareness*, and *Maturity Fears*.⁵ Only score on the *Drive for Thinness* subscale of the EDI predicted a high BSQ score (Multiple $R = .72$, $F = 33.0$, $P < .001$), and the other factors did not significantly add to this prediction. The *Drive for Thinness* subscale measures a strong desire to lose weight, a fear of weight gain and excessive dieting. Thus, among the factors which specifically characterise bulimia nervosa, a high level of concern with shape was best predicted alone by a strong desire to be thinner.

Third, measures of general psychopathological disturbance significantly related to score on the BSQ ($P < .05$) were entered into a regression equation: namely, BDI, self-esteem and social adjustment scores; and scores on the SCL-90 subscales of *Somatization*, *Interpersonal Sensitivity*, *Depression*, *Anxiety*, *Hostility*, *Paranoid Ideation*, *Psychoticism* and the *Global Severity Index*. Only score on the *Interpersonal Sensitivity* subscale of the SCL-90 predicted a high BSQ score (Multiple $R = .59$, $F = 33.3$, $P < .001$), and other factors did not significantly add to this prediction. The *Interpersonal Sensitivity* subscale measures feelings of inadequacy, inferiority, self-deprecation and acute self-consciousness. Thus, among indices of disturbance not specifically associated with bulimia nervosa, a high level of concern with shape was best predicted alone by feelings of self-deprecation.

Last, all measures significantly related to score on the BSQ were entered into a regression equation: namely, current weight, dissatisfaction with weight, highest weight, lowest weight, history of anorexia nervosa (broad criteria), frequency of laxative abuse; EAT, BDI, self-esteem and social adjustment and *Dietary Restraint* scores; and *Drive For Thinness*, *Ineffectiveness*, *Perfectionism*, *Interpersonal Distrust*, *Interceptive Awareness*, *Maturity Fears*, *Somatization*, *Interpersonal Sensitivity*, *Depression*, *Anxiety*, *Hostility*, *Paranoid Ideation*, *Psychoticism* and the *Global Severity Index*. A high level of concern with shape was best predicted by a combination of

⁵ Although the 'Body Dissatisfaction' subscale of the EDI was highly related to the BSQ, the two measures are conceptually similar; and predicting a high BSQ score from the 'Body Dissatisfaction' subscale would yield little information about factors associated with a high level of concern with shape. Therefore, this variable was omitted from this and subsequent regression analyses.

three factors: a high score on the *Drive for Thinness* subscale of the EDI (Multiple $R=.72$, $F=29.8$, $P<.001$), a high body weight (Multiple $R=.80$, $F=24.0$, $P<.001$) and low self-esteem (Multiple $R=.84$, $F=21.4$, $P<.001$). Together these factors accounted for 71 percent of the variance in BSQ scores. This finding must be interpreted with caution since the sample size was too small to conduct two separate regression analyses to allow findings to be cross-validated.

Thus, of the many factors associated with concern with shape among a sample of patients with bulimia nervosa, a high level of such concern was best predicted by the combination of a strong desire to lose weight, a high body weight and low self-esteem.

Discussion

This study represents the first investigation into the significance of concern with shape among patients with bulimia nervosa. In a sample of 72 patients, a high level of concern with shape was associated with a disturbed weight history, disturbed eating behaviour, and a high level of psychopathological disturbance both specifically and non-specifically associated with the eating disorder.

Age was unrelated to concern with shape among these patients, which was contrary to the finding for the sample of women in the community reported in Section 1 of Chapter 3, where younger women were found to be more concerned with their shape compared with slightly older women. However, the patients were all of similar age, and most showed a very high level of concern with their shape. It may be that there was insufficient variability on both factors for the younger patients to show even greater concern with their shape than the older patients. Alternatively, the majority of the women in the community showed only mild concern with their shape. It is possible that age may be a factor influencing the level of concern only when the concern is mild, and other factors may assume greater importance when the concern is marked, as with the patients reported in this study.

Examining weight and weight history, dissatisfaction with weight in terms of the discrepancy between current weight and desired weight, was a stronger predictor of score on the BSQ than current weight or weight history. Therefore, the weight of a patient and her weight history were less important for predicting her level of concern compared with her expressed dissatisfaction with her weight. The relationships between a high level of concern with shape with a high weight, a history of a high weight and marked dissatisfaction with weight were consistent with similar relationships observed among the sample of women in the community.

A history of anorexia nervosa was unrelated to the BSQ, once current weight had been taken into account. Thus, regaining weight after the onset of anorexia nervosa did not appear to make patients with bulimia nervosa any more or any less concerned with their shape. The lack of relationship between a history of anorexia nervosa and concern with shape among patients with bulimia nervosa was contrary to the finding for the women in the community, for whom a history of probable anorexia nervosa was associated with a current high level of concern with shape. It is

possible that a history of anorexia nervosa may be an important factor predicting concern with shape when the level of such concern is quite low, whereas with a very high level of concern a history of anorexia nervosa may assume less importance compared with other factors.

A recent onset of bulimic episodes was associated with a very high level of concern with shape, and the level appeared to decline to a plateau after a year. This suggests that when a woman first experiences bulimic episodes she may be highly concerned with her shape and fatness, whereas once she has been bingeing for many months and perhaps finds that she does not continually gain weight, her level of concern may diminish and then perhaps remain stable, although still at a high level.

Frequency of bulimic episodes was unrelated to score on the BSQ, which suggests that among these women who experienced bulimic episodes, most of whom experienced a very high level of concern with their shape, the number of such episodes made very little difference to the level of concern. This was perhaps surprising since it is conceivable that frequent episodes of gross overeating may lead to a very marked fear of fatness and a high level of concern with shape. The lack of relationship between frequency of bingeing and the BSQ may have been due to the little variability on these measures. Alternatively, frequent bingeing was associated with frequent vomiting, and frequent vomiting was associated with a relatively low level of concern with shape. Frequent vomiting may have counterbalanced any increase in concern arising from overeating since vomiting has been reported to reduce anxiety about becoming fat (Rosen and Leitenberg, 1982). Finding no relationship between frequency of bingeing and concern with shape was contrary to the finding for the women in the community (Section 1, Chapter 3) among whom frequent bingeing was associated with a relatively high level of concern with shape. This difference between samples may have been due to differences in the type of overeating experienced by the women. For the patients, binge eating was established using a clinical interview, whereas for the women in the community binge eating was established using a self-report questionnaire. It is likely that the episodes of overeating described by the women in the community differed from the objective binges experienced by the patients both in the quantity of food consumed and in the subjective loss of control over the eating.

The inverse association between vomiting and concern with shape was contrary to the association between frequent vomiting and a high level of concern with shape found among the women in the community, although similar to these non-patient women, among the patients a high level of concern with shape was associated with laxative abuse.

Among patients with bulimia nervosa a high level of concern with shape was associated with psychopathological disturbance both specifically and non-specifically associated with the eating disorder. It has been argued that the non-specific psychopathology, notably the high levels of anxiety and depression found in these patients, are secondary to the core disturbances of the eating disorder (Cooper and Fairburn, 1986; Fairburn et al, 1986a). This core disturbance includes disturbed eating behaviour and the concerns about shape which the BSQ measures. The significant

relationship between the BSQ and the measures of non-specific psychopathology, particularly with depressed mood and anxiety, are consistent with this view. Thus, the dysphoric mood and high level of situational anxiety often found among patients with bulimia nervosa typically focus on the loss of control over eating, social eating, and concerns about being seen in public when *feeling fat*; and many of the non-specific symptoms resolve in response to measures that enhance control over eating (Fairburn et al, 1986b). The associations between depressed mood, low self-esteem and a high BSQ score among the patients were similar to those observed among the women in the community (described in Section 5 of Chapter 3) and support the suggestion made in Chapter 1 that a high level of concern with shape is closely linked with feelings of self-deprecation.

Examining the additive effects of all factors related to the BSQ, a high level of concern with shape was best predicted by a strong desire to be thinner in combination with a high body weight and a low opinion of self-worth. This would appear to suggest that patients who are not underweight, who show very low self-esteem and have a very strong desire to lose weight, are particularly likely to experience disparaging feelings towards their body shape.

Since concern with fatness is necessary for a diagnosis of bulimia nervosa, at first sight it would seem that all patients should show a very high score on the BSQ, whereas not all patients in the current series did. The concerns with fatness necessary for diagnosing the disorder appear to be a fundamental belief that fatness is odious and reprehensible and that slimness is highly desirable; whereas the concerns measured by the BSQ appear to be a labile state characteristic, reflecting the patient's current level of concern with fatness. Since all patients had a morbid fear of fatness it is possible that those who showed a low score on the BSQ had a latent concern with their shape. Support for this suggestion is to be found in the inverse relationship between vomiting and score on the BSQ. If patients who vomited frequently and showed a low level of concern with their shape were unable to compensate for the fattening effects of overeating, it is likely that their level of concern with shape would become more marked.

One limitation of the study was that the observed relationships with the BSQ were correlational and did not indicate direction of causality. It is unclear whether disturbed eating attitudes and behaviour and a high level of psychopathological disturbance may exacerbate a high level of concern with shape; or whether a high level of concern with shape may exacerbate these other disturbances; or indeed whether all are the product of another factor. The relationships observed between concern with shape and other clinical features of bulimia nervosa suggest that a study of change in concern with shape in relation to response to treatment and outcome from the eating disorder would be worthwhile.

Section 2

Perception of body size in bulimia nervosa

Introduction

Many studies have investigated disturbances in body size perception in patients with anorexia nervosa, but much less attention has been devoted to examining similar disturbances among patients with bulimia nervosa. There have been nine published studies on body size overestimation in patients with bulimic disorders (Norris, 1984; Freeman et al, 1985a;¹ Birtchnell et al, 1985; Garner et al, 1985; Touyz et al, 1985; Williamson et al, 1985; Willmuth et al, 1985; Huon and Brown, 1986; Whitehouse et al, 1986).² However, it is difficult to interpret the results from two of these studies. The study by Huon and Brown (1986) omitted to present group mean estimations, as was discussed in Chapter 1. The report by Williamson et al (1985) was based on the serial pictures method, and using this method it is not possible to say whether an individual overestimates her size since none of the pictures are of her own body. Two of the remaining seven studies (Garner et al, 1985; Touyz et al, 1985) did not include a control comparison sample; but control data may be extrapolated from similar studies published by the same authors (Garner et al, 1976; Touyz et al, 1984; personal communication). Of the seven case controlled studies, only one (Birtchnell et al, 1985) did not find that patients with bulimia overestimated their size significantly more than normal young women. In addition, preliminary findings from these studies suggested that, among patients with bulimia, body size overestimation may be associated with disturbances specifically and non-specifically associated with the eating disorder, such as a history of obesity, a short illness and a high score on the Eating Attitudes Test (Garner and Garfinkel, 1979) which measures disturbed eating attitudes and behaviour (Freeman et al, 1983, 1985a); dissatisfaction with body shape (Willmuth et al, 1985; Whitehouse et al, 1986); and depressed mood (Freeman et al, 1985a).

Thus, the studies of body size perception in patients with bulimia suggest that these patients may show a disturbance in the form of overestimating their body size. In addition to measuring body size overestimation in bulimia, two studies also reported body size dissatisfaction in terms of the discrepancy between perceived and desired size (Freeman et al, 1985a; Williamson et al, 1985). Both studies found that patients with bulimia were considerably more dissatisfied with their size compared with normal women.

¹ An earlier study by Freeman and his colleagues (Freeman et al, 1983) also reported body size perception in patients with bulimia. However, the later study appeared to include these patients in a larger series.

² One other study (Thompson et al, 1986) studied body size perception in various groups of patients with eating disorders, a small number of whom experienced bulimic episodes, but the authors did not use conventional diagnostic criteria for describing these patients, making it difficult to interpret the results from this study.

The reports on body size perception in women with bulimic disorders are of considerable interest, but they are limited for a number of reasons.

With regard to the populations studied, only two reports (Birtchnell et al, 1985; Willmuth et al, 1985) state that their findings were based on patients who clearly satisfied Russell's (1979) criteria for bulimia nervosa. The term bulimia constitutes a broad inclusion criterion, especially when most clinicians define bulimic episodes rather widely. Thus, studies of women who did not satisfy Russell's criteria for bulimia nervosa were probably based on heterogeneous samples.

The populations reported were also unsatisfactory for a number of other reasons. Some studies were based on patients who were consecutive referrals to eating disorder clinics (eg. Norris, 1984), but others were based on women with bulimic disorders who answered recruitment advertisements (eg. Williamson et al, 1985) or who *volunteered* to participate in the study (eg. Touyz et al, 1985). It is possible that patients who were self-selected may have differed on a number of clinical features from patients referred to the eating disorder clinics. This makes it difficult to compare findings between studies which recruited their samples of patients by different methods. In addition, studies do not always state that patients were assessed before the start of treatment (eg. Touyz et al, 1985), which is important since in patients with anorexia nervosa disturbances in body size perception have been associated with a number of indices of illness severity, and many of these indices change during treatment. Several of the studies of body size perception in bulimia were based on small samples of patients. For example, the report by Norris (1984) was based on 12 patients with bulimia. Similarly, control comparison samples were also sometimes small (eg. Garner et al, 1976; Norris, 1984). Three of the studies included no control sample of normal women, as mentioned above. It is essential to compare the estimations of patients with those of controls since it is relative rather than absolute estimation which is important for reasons discussed in Section 3 of Chapter 1.

With regard to the methods used to measure body size perception, only four of the eight studies (Freeman et al, 1983, 1985a; Garner et al, 1985; Touyz et al, 1985; Whitehouse et al, 1986) used the image distortion method, which is the only method reported to have a satisfactory degree of test re-test reliability and concurrent validity, as was discussed in Section 3 of Chapter 1.

As mentioned above, only two of the studies reported dissatisfaction with body size in terms of the discrepancy between perceived and desired size. The little attention devoted to body size dissatisfaction is an important omission since such dissatisfaction would seem to be at least as important as perceived body size *per se*, as was discussed in Chapters 1 and 4.

Perhaps the greatest limitation of the studies is that none examined systematically the clinical significance of disturbances in body size perception by including comprehensive assessments of behavioural disturbance, mental state, and attitudes to shape and weight, and examining the relationship between these and body size perception.

In view of the limitations of the published studies of body size perception in bulimia nervosa, the aims of the present study were:

- (1) To determine whether patients with bulimia nervosa show disturbances in body size perception in the form of overestimating their body size and being markedly dissatisfied with their size.
- (2) To examine the clinical significance of such disturbances by investigating relationships between body size perception and other factors which characterise bulimia nervosa; namely, disturbed eating behaviour and associated weight control measures, psychopathological disturbance specifically and non-specifically associated with the eating disorder, and demographic factors.

Method

Subjects

Bulimia nervosa patients

All patients consecutively referred to an eating disorder outpatient clinic in Cambridge between October 1985 and April 1987 who satisfied Russell's (1979) criteria for bulimia nervosa or DSM III-R criteria for bulimic disorder (Appendix 2), were assessed. None was currently in treatment.

Controls

85 female undergraduate students in two Cambridge colleges were approached and asked to participate in a study of *particular relevance to women*. All agreed.³

Assessments

Bulimia nervosa patients

Patients with bulimia nervosa were asked to complete a number of assessments both specifically and non-specifically associated with the eating disorder:

- (1) Body size perception was measured using the image distortion method described in Section 2 of Chapter 4.⁴
- (2) Demographic features and weight history were assessed using a standardised clinical interview (Cooper and Cooper, 1986).
- (3) Eating behaviour and weight control measures were assessed using the Eating Disorder Examination or EDE (Cooper and Fairburn, 1987) (this measure is described in Section 1 of this Chapter and in Chapter 2).

³ These subjects are also reported in Section 3 of Chapter 4.

⁴ The reliability of this method for patients with bulimia nervosa is reported in Appendix 28.

- (4) Psychopathological disturbance specifically associated with the eating disorder was assessed using:⁵
 - (a) the BSQ (see Chapter 2);
 - (b) the Eating Attitudes Test or EAT (Garner and Garfinkel, 1979);
 - (c) the Eating Disorder Inventory or EDI (Garner et al, 1983);
 - (d) the Three Factor Eating Questionnaire (Stunkard and Messick, 1985).
- (5) Psychopathological disturbance not specifically associated with the eating disorder was assessed using:⁶
 - (a) the Beck Depression Inventory or BDI (Beck et al, 1961);⁷
 - (b) the Rosenberg Self Esteem Scale (Rosenberg, 1965);
 - (c) the Modified Social Adjustment Scale (Cooper et al, 1982);
 - (d) the Symptom Check-List 90 or SCL-90 (Derogatis et al, 1973).

Controls

The university undergraduate students were asked to estimate their body size using the same method as the patients.⁸ Following this, their age, height and weight were recorded and they completed the BSQ.

Results

Subjects

Bulimia nervosa patients

Thirty-four women who satisfied diagnostic criteria⁹ for inclusion in the study were referred to the clinic. Two patients were excluded from the study because they refused to wear a leotard in order to estimate their body size. All 32 women included in the study had a morbid fear of fatness, experienced bulimic episodes and engaged in compensatory behaviour to counteract the effects of overeating by vomiting, abusing laxatives, exercising or very strict dieting.¹⁰

⁵ These measures are described in detail in Section 1 of this Chapter.

⁶ These assessments are described in detail in Section 1 of this Chapter.

⁷ Patients completed the modified 18-item version of this questionnaire, described in Section 1 of this Chapter.

⁸ The reliability of this method for normal women is discussed in Appendix 23.

⁹ A diagnosis was made using the criteria described in Section 1 of this Chapter.

¹⁰ These patients were a subgroup of those reported in Section 1 of this Chapter. The clinical features of these 32 patients were very similar but not identical to those of the larger sample, and are therefore presented in Appendix 29.

Controls

Table 5.2.1 shows that subjects in the control group were of similar weight compared with the patients, but were significantly younger; and as expected they were significantly less concerned with their shape as measured by the BSQ.

Table 5.2.1
Group comparisons

	Bulimia Nervosa Patients (N=32) \bar{x}/sd	Controls (N=82) \bar{x}/sd	t	df	P
Age	22.8 4.1	20.0 1.1	3.78	32.6	.001
MPMW	99.1 10.5	100.0 10.7	0.38	112	>.05
BSQ	134.0 33.8	88.8 29.2	7.08	112	.001

Initial analyses were conducted to determine whether age was related to body size perception.¹¹ Table 5.2.2 shows that for both the sample of patients and the control group, age was unrelated to perceived size, desired size and body size dissatisfaction (ie. perceived size minus desired size). It was therefore considered legitimate to ignore the age difference between the patients and controls.

¹¹ For perceived body size the two trials made from a widely distorted image and the two trials made from a narrowly distorted image were combined to produce a mean estimation; and similarly for desired size.

Table 5.2.2
The relationship between age and body size perception

	Bulimia nervosa Patients Patients (N=32)	Controls (N=82)
	Pearson's r (P>.05)	
Perceived size	-.22	.18
Desired size	.07	-.03
Body size Dissatisfaction	-.19	.17

Patients compared with controls on body size perception

Table 5.2.3 and Figures 5.2.1 and 5.2.2 show that the patients and controls displayed a considerable range in estimations, with some markedly overestimating and others underestimating. Despite this variability, examining the mean estimation for each group, the patients overestimated their size significantly more than the controls. The patients also showed a significantly smaller desired size and were significantly more dissatisfied with their size. Indeed, they were nearly three times more dissatisfied with their body size compared with the controls.

Thus, on all three dimensions of body size perception examined, compared with the controls, the patients showed significantly greater disturbance.

Figure 5.2.1
Variability in perceived size and desired size: patients with
bulimia nervosa and controls

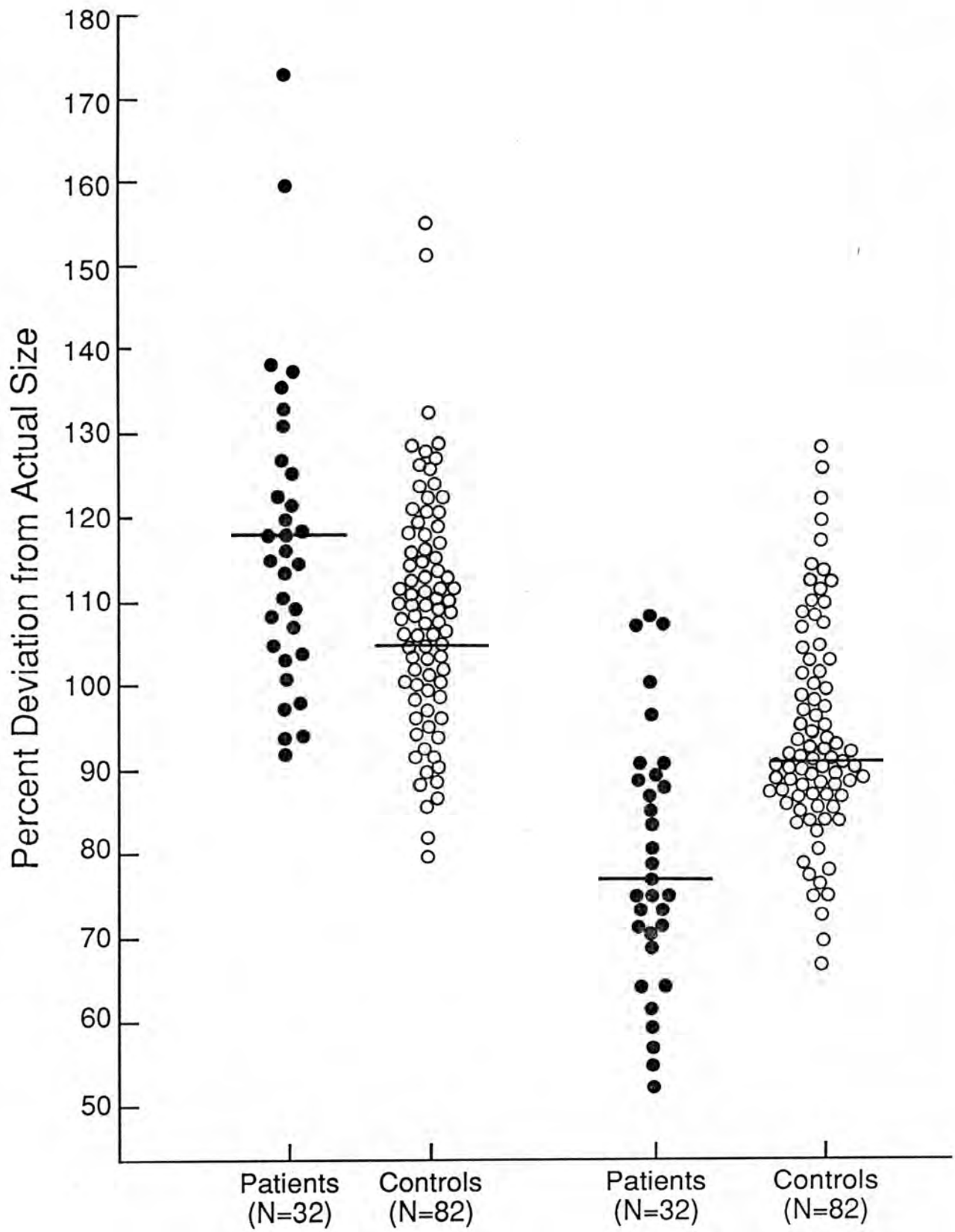


Figure 5.2.2
Variability in body size dissatisfaction: patients with
bulimia nervosa and controls

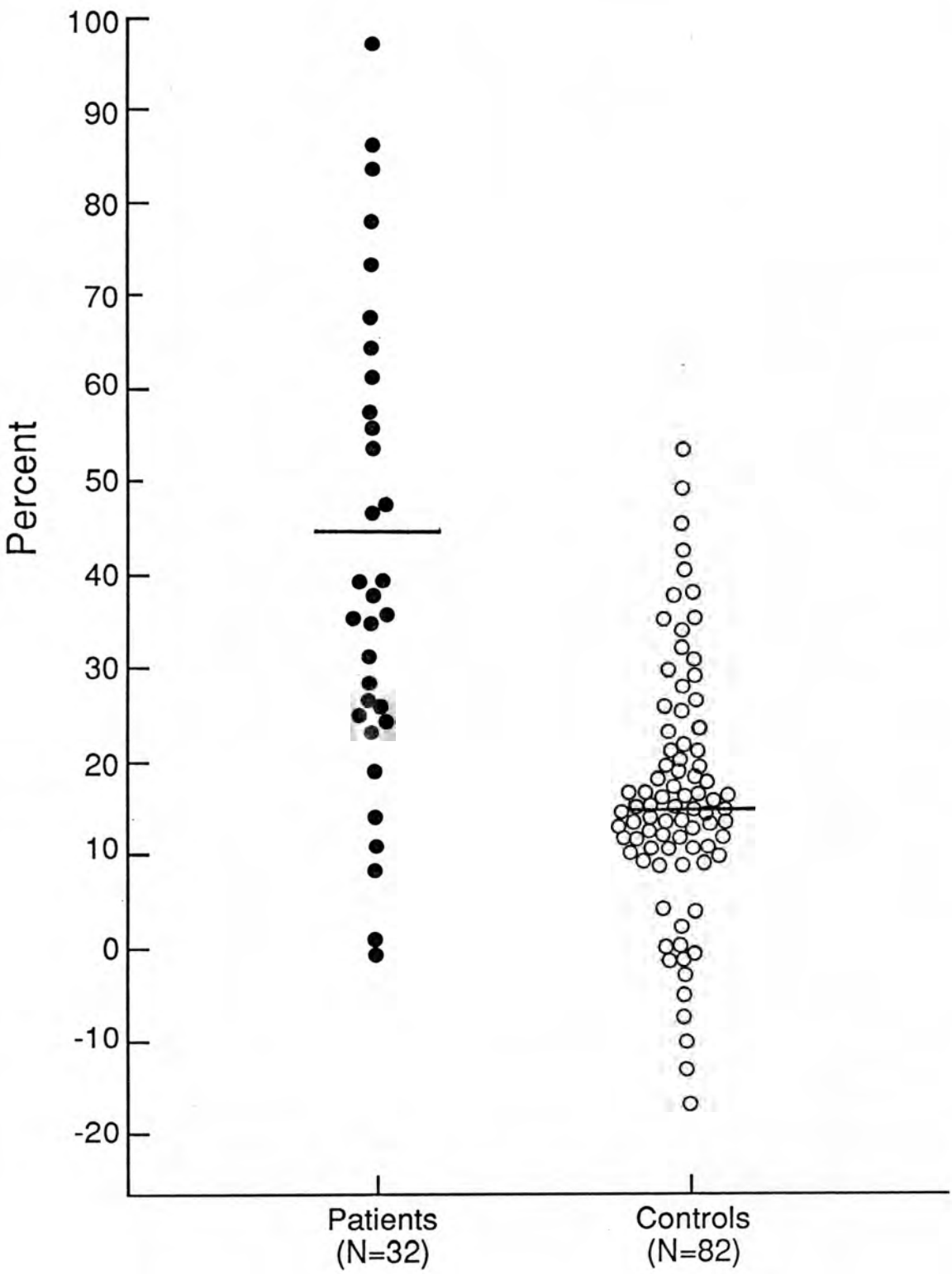


Table 5.2.3
Group differences in body size perception

	Bulimia Nervosa Patients (N=32) \bar{x}/sd	Controls (N=82) \bar{x}/sd	t	df	P
Perceived Size	117.6 18.3	105.8 14.2	3.66	112	.001
Desired Size	77.1 13.7	91.1 11.7	5.50	112	.001
Body Size Dissatisfaction	40.5 25.4	14.7 14.3	5.44	38.9	.001

Factors Associated with Body Size Perception

Weight, weight history and history of anorexia nervosa

Examining weight and weight history, Table 5.2.4 shows that the only factor significantly associated with body size overestimation was highest body weight. However, this relationship, while statistically significant, was not particularly strong; and when weight was treated as a categorical variable, patients with a history of obesity (previous MPMW $\geq 120\%$) showed similar estimations compared with patients with no such history (118.8%, $sd=21.6$, $N=11$ versus 116.9%, $sd=16.9$, $N=21$ respectively; $t=0.27$, $df=30$, $P>.05$).

Table 5.2.4 shows that a high level of body size dissatisfaction¹² was associated with a high body weight and a high level of dissatisfaction with weight; and tended to be associated with a history of a high body weight ($P<.06$). However, as with perceived size, the relationship between a history of a high weight and body size dissatisfaction was not strong; and again patients with a history of obesity were not significantly more dissatisfied with their size compared with patients with no such history (45.4%, $sd=26.1$, $N=11$ versus 38.0%, $sd=25.3$, $N=21$ respectively; $t=0.77$, $df=30$, $P>.05$). Body size dissatisfaction was unrelated to lowest weight and desired weight.

¹² Of the three indices of body size perception, only perceived body size and body size dissatisfaction were examined in relation to other factors. It was decided to not examine the relationship between desired size and other factors since the measure of body size dissatisfaction was in part derived from desired size and would appear to be a more important index of perceptual disturbance, ie. the size a patient wishes to be is a less important index of psychopathological disturbance than her dissatisfaction with her size. Furthermore, it is not particularly useful to compare desired size between subjects since the measure is dependent on actual size.

Table 5.2.4
Relationships between body size perception and weight history

	Perceived Size		Body Size Dissatisfaction	
	r	P	r	P
MPMW	.18	>.05	.38	<.02
Desired Weight	.14	>.05	.24	>.05
Weight Dissatisfaction	.17	>.05	.35	.03
Highest Weight	.31	<.05	.28	.06
Lowest Weight	-.06	>.05	.13	>.05

Body size perception was then examined in relation to a history of anorexia nervosa. Previous anorexia nervosa was defined in two ways:

- (i) A previous body weight of less than 75 percent of average weight (matched for age, height and sex) plus concurrent amenorrhoea, plus a morbid fear of fatness, ie. *narrow* criteria.
- (ii) A previous body weight of less than 85 percent of average weight, plus concurrent amenorrhoea, plus a morbid fear of fatness, ie. *broad* criteria.

As can be seen from Table 5.2.5, with either criterion, patients with and without a history of anorexia nervosa estimated their size similarly and were similarly dissatisfied with their body size.

Table 5.2.5
The relationship between a history of anorexia nervosa and
Body size perception

	N	No history \bar{X}/sd	N	History \bar{X}/sd	t	df	P
Perceived size							
Narrow Criteria	21	115.6 16.2	11	121.5 22.2	0.86	30	>.05
Broad Criteria	12	116.6 16.3	20	118.2 19.8	0.22	30	>.05
Body size dissatisfaction							
Narrow Criteria	21	40.4 24.3	11	40.7 28.5	0.03	30	>.05
Broad Criteria	12	41.6 24.0	20	39.9 26.8	0.18	30	>.05

Thus, the only factor related to body size overestimation was a history of a high weight, and this relationship was not strong. Body size dissatisfaction was associated with a high weight, marked dissatisfaction with weight, and again a history of a high weight although similar to body size overestimation the latter relationship was not strong. Both perceived size and body size dissatisfaction were unrelated to a history of anorexia nervosa.

Eating behaviour and weight control measures

Table 5.2.6 shows the relationship between body size perception and disturbed eating behaviour which characterises bulimia nervosa, ie. duration of bingeing, frequency of bingeing, vomiting, and laxative abuse, and exercise specifically for weight and shape.

Table 5.2.6
Relationships between body size perception and eating and
weight control measures

	Perceived Size		Body Size Dissatisfaction	
	r	P	r	P
Duration of bingeing	-.14	>.05	-.11	>.05
Frequency of bingeing	-.21	>.05	-.29	.05
Frequency of vomiting	-.26	.08	-.39	.02
Frequency of laxative abuse	.06	>.05	.23	>.05
Frequency of Exercise	.02	>.05	-.02	>.05

Table 5.2.6 shows that duration of bulimic episodes was not linearly related to body size overestimation and body size dissatisfaction. Similarly, as can be seen from Table 5.2.7, patients with a recent onset of bulimic episodes were no different on measures of body size perception than patients who had been bingeing for longer.

Table 5.2.7
The relationship between duration of bingeing and
Body size perception

	≤ 1 year (N=10) \bar{x}/sd	> 1 year (N=22) \bar{x}/sd	t	df	P
Perceived size	120.5 18.7	116.2 18.4	0.61	30	$>.05$
Body size Dissatisfaction	49.2 24.8	36.6 25.2	1.31	30	$>.05$

As can be seen from Table 5.2.6, frequency of bingeing was unrelated to body size perception, although infrequent bingeing tended to be associated with greater body size dissatisfaction. Table 5.2.8 shows that the latter association was not strong. Patients who binged less than daily were similarly dissatisfied with their body size compared with patients who binged at least every day; and the two groups showed similar estimations of perceived body size.

Table 5.2.8
The relationship between frequency of bingeing and body size perception

	$< \text{daily}$ (N=19) \bar{x}/sd	$\geq \text{daily}$ (N=13) \bar{x}/sd	t	df	P
Perceived size	120.2 18.7	113.7 17.8	0.99	30	$>.05$
Body size Dissatisfaction	46.0 24.2	32.5 25.9	1.51	30	$>.05$

Table 5.2.6 shows that frequent vomiting tended to be inversely associated with body size overestimation and was significantly and inversely associated with body size dissatisfaction. The relationship between body size dissatisfaction and infrequent vomiting was independent of current weight (Partial $r = .30$, $P < .05$), but the relationship between body size overestimation and infrequent vomiting was not independent of current weight (Partial $r = -.22$, $P > .05$). Table 5.2.9

shows that among patients who vomited, those who did so less than daily overestimated their size significantly more and were significantly more dissatisfied with their size compared with patients who vomited more frequently.¹³

Table 5.2.9
The relationship between body size perception and frequency of vomiting

	< daily (N=12) \bar{X}/sd	\geq daily (N=15) \bar{X}/sd	t	df	P
Perceived size	126.6 23.0	109.8 12.3	2.29	15.9	.04
Body size Dissatisfaction	54.8 18.7	28.8 18.7	2.86	25	.01

Among patients who vomited, the associations between frequent vomiting and disturbances in body size perception were independent of current weight. Using analysis of covariance to control for current weight, compared with patients who vomited at least every day, those who vomited less often still overestimated their size significantly more (adjusted means=110.2 versus 126.3; $F=4.85$, $df=1,24$, $P<.04$) and were significantly more dissatisfied with their body size (adjusted means=30.6 versus 52.9; $F=5.74$, $df=1,24$, $P<.03$).

Thus, compared with frequent vomiting, infrequent vomiting was associated with a high level of disturbance in body size perception, and this association was independent of current body weight. Frequent vomiting was also associated with frequent bingeing ($r=.61$, $P<.001$); and the relationship between infrequent bingeing and body size dissatisfaction was mediated by frequency of vomiting. Using a partial correlation coefficient to control for the relationship between vomiting and body size dissatisfaction, frequent bingeing was no longer significantly associated with a low level of body size dissatisfaction (Partial $r=-.08$, $P>.05$).

Table 5.2.6 shows that frequency of abusing laxatives was unrelated to both body size overestimation and body size dissatisfaction; and Table 5.2.10 shows that patients who abused laxatives were similar on these measures compared with non-laxative users.

¹³ It was not possible to compare patients who vomited with those who did not, since only four patients did not vomit.

Table 5.2.10
The relationship between body size perception and laxative abuse

	Non-laxative Abusers (N=19) \bar{x}/sd	Laxative Abusers (N= 13) \bar{x}/sd	t	df	P
Perceived size	117.7 21.2	117.5 14.0	0.03	30	>.05
Body size Dissatisfaction	36.6 26.2	46.3 24.0	1.06	30	>.05

Similar to laxative abuse, exercise specifically for weight and shape was unrelated to body size overestimation and body size dissatisfaction, as shown in Table 5.2.6; and Table 5.2.11 shows that patients who exercised were similar on these measures of body size perception compared with patients who did not engage in this form of exercise.

Table 5.2.11
The relationship between exercise and body size perception

	Non-exercisers (N=13) \bar{x}/sd	Exercisers (N=19) \bar{x}/sd	t	df	P
Perceived size	117.6 19.0	117.6 18.4	0.01	30	>.05
Body size	39.4 27.3	41.3 24.7	0.21	30	>.05

Thus, examining the disturbed eating behaviour characteristic of bulimia nervosa and the associated weight control behaviour, patients with a short history of the disorder were no different on the measures of body size perception compared with patients with a long history of the disorder. Similarly, laxative abuse and exercise specifically for weight and shape were unrelated to body size perception. Frequency of bingeing was unrelated to body size overestimation but infrequent bingeing was associated with a high level of body size dissatisfaction, although this

relationship was mediated by frequency of vomiting. Infrequent vomiting was associated with overestimating body size and a high level of dissatisfaction with body size.

Specific psychopathology

Both body size overestimation and body size dissatisfaction were significantly associated with a high score on the BSQ (for perceived size $r=.53$, $P<.001$; and for body size dissatisfaction $r=.75$, $P<.001$). Table 5.2.12 shows that patients who showed *Marked* concern with their shape (ie. $BSQ>140$; see Chapter 2) overestimated their size significantly more and were significantly more dissatisfied with their size compared with patients who showed less concern.

Table 5.2.12
The relationship between concern with shape and body size perception

	≤Moderate Concern (N=18) \bar{X}/sd	Marked Concern (N=14) \bar{X}/sd	t	df	P
Perceived size	109.5 11.0	128.0 20.9	3.02	18.5	.01
Body size Dissatisfaction	26.8 16.8	58.2 23.9	4.37	30	.001

Table 5.2.13 shows that body size overestimation and body size dissatisfaction were associated with a number of other indices which characterise patients with eating disorders, as measured by the EAT, the EDI and the Three Factor Eating Questionnaire. Both body size overestimation and body size dissatisfaction were associated with a strong desire to lose weight, dissatisfaction with body shape, feelings of inadequacy, interpersonal difficulties, and difficulty identifying hunger and satiety; and body size dissatisfaction was also associated with excessive expectations for personal achievement and feeling overwhelmed by the demands of adulthood. It is noteworthy that none of these factors was as strong a predictor of either body size overestimation or body size dissatisfaction as the BSQ. Also worthy of note is that score on the EAT and level of dietary restraint were unrelated to both indices of body size perception. Most patients showed high EAT and high restraint scores, and there may have been insufficient variability on these measures for them to have been associated with body size perception.

Table 5.2.13
Relationships between body size perception and measures of
Specific psychopathology

	Perceived Size		Body Size Dissatisfaction	
	r	P	r	P
EAT	.05	>.05	.18	>.05
EDI				
Drive for Thinness	.42	.01	.62	.001
Bulimia	.13	>.05	.22	>.05
Body Dissatisfaction	.35	.04	.66	.001
Ineffectiveness	.49	.01	.49	.01
Perfectionism	.24	>.05	.38	.03
Interpersonal Distrust	.46	.01	.61	.001
Interoceptive Awareness	.34	.04	.41	.02
Maturity Fears	.25	>.05	.35	.04
Three Factor Eating Questionnaire				
Dietary Restraint	-.02	>.05	.13	>.05
Disinhibition	.05	>.05	.13	>.05
Perceived Hunger	-.10	>.05	-.03	>.05

Thus, some of the measures of the specific psychopathology of bulimia nervosa were associated with disturbances in body size perception. Of particular note, marked concern with body shape was highly associated with both overestimating body size and a high level of dissatisfaction with body size. Other measures associated with both indices of body size perception included a strong desire to lose weight, feelings of inadequacy, and difficulty forming close relationships. It is noteworthy that disturbances in body size perception were unrelated to a high level of dietary restraint and disturbed eating attitudes and behaviour as measured by the EAT.

Non-specific psychopathology

Table 5.2.14 shows that a number of indices of general psychopathology were significantly associated with body size overestimation and body size dissatisfaction. These included measures of anxiety, social functioning, obsessionality and low self-esteem. Of particular note was the association of both overestimation and dissatisfaction with the *Interpersonal Sensitivity* subscale of the SCL-90, which was one of the best predictors of both aspects of body size perception. This factor measures feelings of inadequacy, inferiority, self-deprecation and acute self-consciousness (and was also highly related to concern with shape: see Section 1 of this Chapter). The *Global Severity Index* of the SCL-90 was also highly correlated with both overestimation and dissatisfaction, indicating that disturbances in body size perception are associated with a high level of general psychopathological disturbance. Surprisingly, although the *Depression* factor of the SCL-90 was significantly correlated with body size overestimation and body size dissatisfaction, the BDI was unrelated to both aspects of body size perception. However, the great majority of the patients showed a high level of depression, and it may have been that there was insufficient variability in scores on the BDI for this measure to be associated with disturbances in body size perception.

Table 5.2.14
Relationships between body size perception and
non-specific psychopathology

	Perceived size r	P	Body size dissatisfaction r	P
BDI	.21	>.05	.26	.08
Self-esteem	-.48	.01	-.48	.01
Social Adjustment	.42	.01	.40	.01
SCL-90				
Somatization	.38	.02	.40	.02
Obsessive Compulsive	.51	.01	.34	.03
Interpersonal Sensitivity	.51	.01	.61	.001
Depression	.32	.05	.37	.03
Anxiety	.56	.001	.39	.02
Hostility	.33	.04	.25	.09
Phobic Anxiety	.51	.01	.41	.02
Paranoid Ideation	.43	.01	.36	.03
Psychoticism	.31	.05	.31	.05
Global Severity Index	.53	.001	.48	.01

Thus, disturbances in body size perception were associated with a generally poor mental state, low self-esteem and poor social adjustment. It is particularly noteworthy that both body size overestimation and a high level of dissatisfaction with body size were highly associated with feelings of self-deprecation and low self-esteem.

Predicting disturbances in body size perception

Since a number of factors were found to predict disturbances in body size perception, stepwise multiple linear regression analyses were used to identify subsets of factors which produced the best prediction of body size overestimation and body size dissatisfaction.

First, all measures significantly associated with perceived size ($P<.05$) were entered into a regression equation: namely, highest weight, self-esteem, social adjustment; the EDI subscales of *Drive for Thinness*, *Body Dissatisfaction*, *Ineffectiveness*, *Interpersonal Distrust*, and *Interoceptive Awareness*; and the SCL-90 subscales of *Somatization*, *Obsessive-Compulsive*, *Depression*, *Interpersonal Sensitivity*, *Anxiety*, *Anger-Hostility*, *Phobic Anxiety*, *Paranoid Ideation*, *Psychoticism*, and the *Global Severity Index*. Body size overestimation was best predicted by the *Anxiety* factor of the SCL-90 (Multiple $R=.56$, $F=11.26$, $P<.001$); and the BSQ significantly added to this prediction (Multiple $R=.67$, $F=9.69$, $P<.001$).

Second, all measures significantly associated with body size dissatisfaction were entered into a regression equation: namely, current weight, weight dissatisfaction, highest weight, frequency of vomiting, self-esteem, social adjustment; the EDI subscales of *Drive for Thinness*, *Body Dissatisfaction*, *Ineffectiveness*, *Perfectionism*, *Interpersonal Distrust*, *Interoceptive Awareness* and *Maturity Fears*; and the SCL-90 subscales of *Somatization*, *Obsessive-Compulsive*, *Depression*, *Interpersonal Sensitivity*, *Anxiety*, *Phobic Anxiety*, *Paranoid Ideation*, *Psychoticism* and the *Global Severity Index*. Only the BSQ predicted body size dissatisfaction, with no other factors significantly adding to this prediction (Multiple $R=.75$, $F=31.64$, $P<.001$).

Since both the BSQ and the *Body Dissatisfaction* subscale of the EDI were highly related to body size dissatisfaction, and all three measures assess aspects of body dissatisfaction, they are conceptually similar measures. Therefore, a further regression analysis was conducted to predict body size dissatisfaction omitting the BSQ and the *Body Dissatisfaction* subscale of the EDI. Results from this analysis showed that the *Drive for Thinness* subscale of the EDI significantly predicted body size dissatisfaction (Multiple $R=.62$, $F=15.37$, $P<.001$); and the *Somatization* factor of the SCL-90 significantly increased this prediction (Multiple $R=.73$, $F=13.9$, $P<.001$). The somatization subscale measures distress arising from perception of bodily dysfunction (see Section 5 of Chapter 3).

Thus, body size overestimation was best predicted by anxiety and a high level of concern with shape; and body size dissatisfaction was best predicted by an excessive pursuit of thinness and preoccupation with dieting, and by distress arising from perceptions of bodily dysfunction.

Discussion

This study examined body size perception in a consecutive series of newly-referred patients with bulimia nervosa. Although other studies have reported body size perception in women suffering from bulimic disorders, they were unsatisfactory for a number of reasons. They did not specify precisely the criteria used to define their samples; or they did not assess consecutively referred patients; or they assessed only small numbers of women; or they included no control comparison group; or they used methods of measuring body size perception whose reliability and validity are questionable; or they did not examine other aspects of body size perception aside from perceived body size; or they failed to question the clinical significance of disturbances in body size perception. The current study was designed to improve on these limitations. All patients satisfied Russell's (1979) criteria for bulimia nervosa, and an operational criterion was used to define a morbid fear of fatness; patients were consecutive referrals to an eating disorder outpatient clinic; the sample size was larger than most samples reported in published studies; patients were compared with a large control comparison sample of normal young women; the women were assessed on a measure of body size perception which has been shown to have a satisfactory degree of test re-test reliability and concurrent validity for both patients with bulimia nervosa and controls; and the significance of disturbances in body size perception was investigated by examining the relationship between such disturbances and responses on a range of standardised measures of disturbance both specifically and non-specifically associated with the eating disorder.

It was found that patients with bulimia nervosa overestimated their size significantly more than normal young women, although the difference between the two groups was not great, being only 12 percent. Other published studies which have reported that patients with eating disorders overestimate their size significantly more than normal young women have presented similar differences between patients and non-patients, and have regarded such differences as being clinically highly significant. However, a difference of 12 percent between the estimations of patients with an eating disorder and controls would not appear to represent what Bruch (1962) described as *A disturbance in body image of delusional proportions*. Although body size overestimation does appear to characterise patients with bulimia nervosa, it is one of many clinical features of the disorder; and in view of the large degree of overlap between the estimations of patients and controls, body size overestimation would certainly not be a useful criterion for distinguishing patients from controls.

The findings concerning body size dissatisfaction appeared to be of greater significance than those concerning body size overestimation *per se*: despite being of similar weight to the controls and therefore similar in terms of actual size, the patients wished to have a significantly thinner body shape. It has been found that the desired weight of patients with bulimia nervosa is similar to that of women in the general population, and from this it was concluded that these patients rarely pursue thinness (Fairburn and Cooper, 1984a). The latter conclusion and the findings from the present study suggest that, although patients with bulimia nervosa do not desire a very low

weight, they wish to be thinner than women in the general population, which is one example where concerns about size and weight may be independent of each other and not necessarily related.

The present study represents the first systematic attempt to relate disturbances in body size perception to other clinical features of bulimia nervosa. Both body size overestimation and body size dissatisfaction were found to be associated with disturbances specifically associated with the eating disorder. Of particular note were a high level of concern with shape, a strong desire to lose weight and feelings of ineffectiveness. Disturbances in body size perception were also found to be significantly associated with a number of indices of general psychological disturbance. Of particular note were feelings of self-deprecation, inadequacy, inferiority and low self-esteem. The latter findings are consistent with Beck's suggestion that personal negative cognitions may focus on body size and shape and seeing oneself as fat (Beck, 1973).

Multiple linear regression analysis was used to determine which factors produced the best prediction of disturbances in body size perception. Body size overestimation was best predicted by a high level of anxiety and a high level of concern with shape. From the assessments used it was not possible to examine the exact nature of the anxiety reported by the patients. However, Cooper and Fairburn (1986) have suggested that the neurotic symptoms of bulimia nervosa tend to be directly related to aspects of the specific psychopathology of the eating disorder. Thus, in their analysis, the anxiety reported by patients tended to arise in situations associated with food and eating or situations which made the patients feel self-conscious about their shape. It would seem likely that the anxiety which emerged as such a strong predictor of body size overestimation was of a secondary nature to the specific psychopathology of bulimia nervosa.

Examining factors which best predicted body size dissatisfaction, aside from concern with body shape, a high level of dissatisfaction with body size was best predicted by an extreme desire to lose weight and distress arising from perceptions of bodily dysfunction as measured by the *Somatization* subscale of the SCL-90. Questions on this subscale may be endorsed in relation to the physical consequences of bingeing and weight control measures. For example, some of the questions ask whether paraesthesia, aches and pains, weakness, nausea and an upset stomach have been experienced. Thus, a high level of body size dissatisfaction was best predicted by a strong desire to be thinner and physical bodily discomfort. Bulimic episodes were unrelated to disturbances in body size perception. Since both frequent bingeing and disturbances in body size perception may be regarded as indices of severity of illness, this lack of association was surprising, and indicates that apparent indices of severity are not necessarily linearly related. Other studies have also found that the characteristics of bulimia nervosa are not always linearly or positively related. For example, in Section 1 of this Chapter a non-linear relationship was found between duration of bingeing and concern with shape, and an inverse relationship between frequency of vomiting and concern with shape; and Fairburn and Cooper (1984b) reported an inverse relationship between frequency of vomiting and body weight.

Similar to bulimic episodes, a number of other aspects of the specific psychopathology of bulimia nervosa were found to be unrelated to disturbances in body size perception. Dietary restraint was one such factor. This was surprising since patients with bulimia nervosa are characterised by a high level of dietary restraint (Fairburn and Cooper, 1984a); and, since the current study found that these patients were also characterised by disturbances in body size perception, it might have been expected that dietary restraint and body size perception would be related. However, there was little variability on the measure of dietary restraint since the great majority of the patients were very restrained eaters; and this lack of variability may explain why dietary restraint was unrelated to body size perception. Score on the EAT was also unrelated to body size perception, which again may be attributable to the little variance on this measure since almost all of the patients showed a very high score. The lack of relationship between score on the EAT and body size perception was contrary to reports by Freeman and his colleagues (Freeman et al, 1983; 1985a), who found significant associations between body size overestimation and body size dissatisfaction with score on the EAT. However, Freeman and his colleagues used different diagnostic criteria to define their subjects compared with the criteria used in the current study, which may explain different findings. Also worthy of note is that exercise specifically for weight and shape was unrelated to body size perception, which may have been because few of the patients used exercise to compensate for the fattening effects of bingeing, and hence there was little variability on the measure of exercise.

Although some of the measures of the specific psychopathology of bulimia nervosa were unrelated to disturbances in body size perception, both aspects of body size perception were highly predicted by one measure of the specific psychopathology; namely, concern with shape. Indeed, a high level of concern with shape was the best predictor of body size dissatisfaction above all other measures examined, and only one other measure was a stronger predictor of body size overestimation. It therefore appears that the two components of body image are closely related among patients with bulimia nervosa.

Examining the measures of non-specific psychopathology, although depressed mood as measured by the SCL-90 was significantly associated with both body size overestimation and body size dissatisfaction, depressed mood as measured by the BDI was unrelated to body size perception, which was contrary to findings for normal young women reported in Sections 1 and 2 of Chapter 4. However, most of the patients showed a high level of depression, and similar to several of the measures of specific psychopathology, there was little variation in BDI scores. Again, it is possible that the lack of relationship between body size perception and depressed mood as measured by the BDI was due to the little variance in mood.

To summarize, the present study constitutes the first major attempt to systematically relate disturbances in body size perception in bulimia nervosa to other clinical features of the disorder. Patients were found to overestimate their size significantly more than normal young women, preferred a significantly thinner size and were markedly more dissatisfied with their size. Despite

these differences between groups, patients showed a considerable range in estimations; some overestimated much more than others and were markedly more dissatisfied with their size than others. Among the patients, body size overestimation and body size dissatisfaction were associated with a number of disturbances specifically associated with the eating disorder (notably, a high level of concern with shape, a desire for thinness and vomiting), and also with more general psychological disturbance (notably, self-depreciatory feelings and a generally poor mental state). Thus, among patients with bulimia nervosa, disturbances in body size perception were found to be associated with disturbed eating behaviour and a high level of psychological distress. Since a number of the factors found to be related to disturbances in body size perception among the patients have been reported to change during treatment for the eating disorder (Fairburn et al, 1986b), the relationship between body size perception and response to treatment and outcome from the eating disorder needs to be investigated.

Section 3

Changes in body image following treatment for bulimia nervosa

Introduction

Sections 1 and 2 of this Chapter found that patients with bulimia nervosa showed what may be termed a *disturbance in body image* in that they overestimated their body size significantly more than normal young women, preferred a significantly thinner body size, were markedly more dissatisfied with their size, and were highly concerned with their shape. A high level of concern with shape was in turn associated with disturbances in body size perception; and both these aspects of body image were associated with particular indices of behavioural and psychopathological disturbance which characterise bulimia nervosa. It was suggested that the relationship between body image disturbance and features of the eating disorder may be important in response to treatment and outcome from the eating disorder.

Of the few published studies on body size perception in patients with bulimic disorders, only one (Birtchnell et al,1985) examined change following treatment for the eating disorder. Using the moveable calliper technique, overestimation of waist and hip size but not chest size were found to significantly decrease following a ten-week course of treatment for bulimia nervosa, and the authors concluded that this change was due to treatment. However, the findings from this study are limited for several methodological reasons. First, from the pre-treatment sample of 50 patients, follow-up data were based on a subgroup of 29 patients (58 percent). It is not entirely clear why nearly half the patients were not re-assessed after treatment, but it is possible that they may have differed from those who completed the course of treatment. Bulimia nervosa has been reported to be an intractable disorder which is difficult to treat (Russell,1979), and yet of the patients who completed treatment and were re-assessed, the majority had regained control over their eating. Therefore, it is possible that those patients who were not re-assessed may have been responded poorly to treatment, which in turn may have influenced findings. Second, the study by Birtchnell and her colleagues used the moveable calliper technique to measure body size perception, and there are at least two problems associated with this method (as was reviewed in Chapter 1). Its test re-test reliability has not been investigated among patients with eating disorders, even though a small group of normal young women have been reported to show moderately consistent estimations across occasions (Ben-Tovim et al,1984). It does not necessarily follow that because the method is moderately reliable for normal women it is also reliable for patients with eating disorders, since compared with normal women the estimations of patients with eating disorders have been found to be more influenced by the specific conditions of the testing situation (Proctor and Morley,1986). A further problem with the moveable calliper technique is that it has not been reported to show a satisfactory degree of concurrent validity, and it is not clear whether judging

the distance between two moveable markers captures a patient's perception of her size. A third limitation of the report by Birtchnell and her colleagues is that the authors did not compare post-treatment estimations with those of a control group, and it would appear relevant to examine whether estimations after treatment are similar to those of controls. Finally, Birtchnell and her colleagues did not question the significance of change in body size perception in relation to response to treatment and outcome from the eating disorder, and simply reported that estimations of two out of three body areas decreased following treatment. Such a finding is not particularly useful clinically unless the relationship between a disturbance in body size perception and response to treatment is examined. It is possible, for example, that such a disturbance at the start of treatment may predict response to treatment and outcome from the eating disorder; or a disturbance at the end of treatment may be related to outcome; or the extent of change in body size perception during treatment may be associated with the extent of improvement in regaining control over eating. Thus, while the study by Birtchnell and her colleagues is of some interest, it raises more questions than it answers.

One other study (Freeman et al, 1985b) examined body size perception in relation to treatment for bulimia nervosa, and reported that body size dissatisfaction (ie. the discrepancy between perceived and desired size) at the end of treatment predicted relapse from the eating disorder. Thirty-nine patients completed assessments of body size perception and a number of other measures before and after an eight month course of psychotherapy; and a follow-up interview was conducted six months after treatment. Body size dissatisfaction at the end of treatment significantly predicted relapse six months later; and this factor was a stronger predictor than body size overestimation, disturbed eating attitudes and behaviour and depressed mood measured both before and after treatment. Thus, this study suggests that body size perception may be important in relation to outcome from bulimia nervosa. However, similar to the study by Birtchnell and her colleagues, the study by Freeman and his colleagues also had a number of limitations. Findings were based on only those patients who were deemed to have recovered by the end of treatment, and those who had not regained control over their eating were excluded from the study. It is therefore unclear whether treatment response is related to disturbances in body size perception, measured either before or at the end of treatment. The study also did not report how many patients were not re-assessed at the end of treatment and at follow-up six months later, and it is therefore not clear whether the patients reported are representative of the consecutive referrals initially assessed. A further problem with the study is that the follow-up interview at six months was conducted by telephone, and it is not clear whether information collected in this way is comparable with information collected in the confidential setting of an interview conducted in a clinic. Perhaps the greatest limitation of the study by Freeman and his colleagues is that they did not report change in body size perception during treatment, and how this may relate to changes in disturbed eating behaviour and outcome from the eating disorder.

Only one study has examined concern with shape before and after treatment for bulimia (Wooley and Kearney-Cooke, 1986), and none has examined concern with shape in relation to response to treatment for bulimia nervosa. This is surprising since it has been suggested that attitudes towards shape may be important in maintaining the eating disorder (Fairburn et al, 1986a). Wooley and Kearney-Cooke reported that for a sample of 32 women with bulimia, level of dissatisfaction with specific body parts as measured by the Body Cathexis Scale (Secord and Jourard, 1953) and the *Body Dissatisfaction* subscale of the Eating Disorder Inventory (Garner et al, 1983) was significantly lower after treatment compared with before. Follow-up data one year after treatment was available for a sub-sample of 15 women, and showed that improvement in the level of body dissatisfaction was maintained. The women received a three-and-a-half week programme of intensive residential treatment, which included therapy aimed at creating more positive feelings towards body shape. However, similar to the studies by Birtchnell and Freeman and their colleagues, the study by Wooley and Kearney-Cooke also had major limitations, again in relation to the patient sample, the measures used and the significance of change in body image. First, the authors did not clearly specify the diagnostic criteria used to classify their patients with bulimia and did not report their clinical features. It is possible that the sample included women who did not satisfy DSM III criteria for bulimia, and there are indications that some of the patients were suffering from anorexia nervosa, which make findings difficult to interpret. It is also not clear how the women were recruited into the intensive treatment programme, how many refused treatment and how many did not complete treatment. The authors stated that their clinic had treated several hundred women with bulimia but did not explain why their post-treatment data was based on a sub-sample of 32 patients. Second, Wooley and Kearney-Cooke examined only one aspect of concern with shape, ie. dissatisfaction with specific body parts. While dissatisfaction is undoubtedly an important aspect of concern with shape, it is one of many aspects (as was discussed in Chapter 2). Finally, Wooley and Kearney-Cooke did not examine the significance of concern with shape in relation to response to treatment and outcome from the eating disorder.

It would appear worthwhile to study concern with shape and body size perception in relation to treatment for bulimia nervosa for three main reasons. First, disturbances in body size perception and concern with shape may be important in relation to outcome from an eating disorder. Bruch (1962) claimed that a realistic body image is a precondition to recovery from anorexia nervosa; and Fairburn and his colleagues (Fairburn et al, 1986a) suggested that a change in maladaptive beliefs about shape may be necessary for a full and lasting recovery from an eating disorder. Second, there have been only three studies of concern with shape and body size perception in relation to treatment for bulimia, as discussed above, and the findings from these studies are severely limited because of methodological problems. Third, in Sections 1 and 2 of this Chapter a high level of concern with shape and disturbances in body size perception were found to be associated with a number of clinical features of bulimia nervosa, and many of these clinical features change during treatment (Fairburn et al, 1986b); and yet no study has examined

change in body size perception and concern with shape in relation to outcome from the eating disorder. In view of these points, the aims of this study were:

- (i) To examine whether perception of body size and concern with shape change following treatment for bulimia nervosa;
- (ii) To examine whether change in body size perception is associated with change in concern with shape;
- (iii) To examine changes in body size perception and concern with shape in relation to change in level of depression;
- (iv) To examine changes in body size perception and concern with shape in relation to change in disturbed eating behaviour and outcome from the eating disorder.

Method

Subjects

Bulimia nervosa patients

Fifteen patients¹ who satisfied Russell's (1979) criteria for bulimia nervosa were assessed before and after a course of psychological treatment.² Treatment lasted between four-and-a-half and five months and aimed at helping patients regain control over their eating.

Controls

The patients were compared with a control group of 82 female university students.³

Assessments

The patients and controls were assessed on standardised measures, and for the patients these assessments were completed before and after treatment.

- (i) Body size perception was assessed using the image distortion method, reported in detail in Section 2 of Chapter 4. Using this method, patients and controls estimated their body size and indicated their desired size.⁴
- (ii) Both groups completed the Body Shape Questionnaire or BSQ (see Chapter 2).

¹ These patients formed a subgroup of those reported in Section 2 of this Chapter. Of the 32 patients reported in Section 2, 7 did not receive treatment, 1 was withdrawn from treatment because her psychiatric state deteriorated, 2 did not complete treatment, 1 refused to estimate her body size at the end of treatment, 1 was pregnant at the end of treatment and was therefore not asked to estimate her body size, and 5 were currently still in treatment.

² The treatment these patients received was a cognitive behavioural treatment based on the programme described by Fairburn (1985).

³ These women are also reported in Section 2 of this Chapter.

⁴ The reliability of this method is reported in Appendix 28 for women with bulimia nervosa and in Appendix 23 for normal women.

- (iii) The age, height and weight of women in both groups were recorded.
- (iv) For the patients, the Eating Disorder Examination (Cooper and Fairburn,1987) was used to assess frequency of bingeing and vomiting over the past month, both before and after treatment.
- (v) For the patients, level of depression was assessed using the Beck Depression Inventory or BDI (Beck et al,1961).⁵
- (vi) The patients completed the Eating Attitudes Test or EAT (Garner and Garfinkel,1979), which measures disturbed eating attitudes and behaviour.

Results

Subjects

Table 5.3.1 shows the age and weight of the patients and controls. Both before and after treatment the patients were of similar weight compared with the controls, but were significantly older.⁶

Table 5.3.1
The age and weight of patients and controls

	Patients (N=15) \bar{X}/sd	Controls (N=82) \bar{X}/sd	t	df	P
Age	23.3 4.8	20.0 1.1	2.64	14.3	.02
Weight before Treatment	97.5 11.2	100.0 10.7	0.80	95	>.05
Weight after Treatment	97.1 10.1	100.0 10.7	0.96	95	>.05

Table 5.3.2 shows a number of clinical features of the patients before and after treatment. Although their weight remained largely unchanged, their disturbed eating behaviour and mood were markedly improved by the end of treatment.

⁵ Patients completed the 18-item version of this Questionnaire, described in Section 1 of this Chapter.

⁶ Since age was unrelated to body size perception and concern with shape among patients with bulimia nervosa, as was reported in Sections 1 and 2 of this Chapter, differences in age between the two groups were not considered a problem for interpreting other group differences.

Table 5.3.2
Clinical features of the patients

	Before Treatment \bar{X}/sd	After Treatment \bar{X}/sd	t	df	P
MPMW	97.5 11.2	97.1 10.1	0.33	14	>.05
EAT Score	48.0 17.9	19.1 15.7	5.85	14	.001
BDI Score	22.7 9.7	10.7 9.4	5.56	14	.001
Bulimic ¹ Episodes	31.1 18.6	7.7 13.2	5.47	14	.001
Vomiting ¹	40.2 47.9	6.5 12.8	3.12	14	.01

¹ Frequency over past month

Changes in body size perception and concern with shape

Figure 5.3.1 shows perceived body size before and after treatment for bulimia nervosa. Twelve of the 15 patients overestimated their size less at the end of treatment. Using a t-test for matched samples, this difference between pre- and post-treatment estimations was statistically significant (111.9%, $sd=18.0$ versus 104.3%, $sd=10.2$; $t=2.25$, $df=14$, $P<.05$). In Table 5.3.3 perceived size is compared before and after treatment with the perceived size of the control group. At the end of treatment the estimations of the patients were very similar to those of the controls. Before treatment the patients tended to overestimate their size more than the controls although this difference between groups did not reach statistical significance,⁷ which was perhaps due to the large range in estimations within the small sample of patients.

⁷ In Section 2 of this Chapter the total sample of 32 patients overestimated their size significantly more than the controls.

Figure 5.3.1
Change in perceived size following treatment for bulimia nervosa

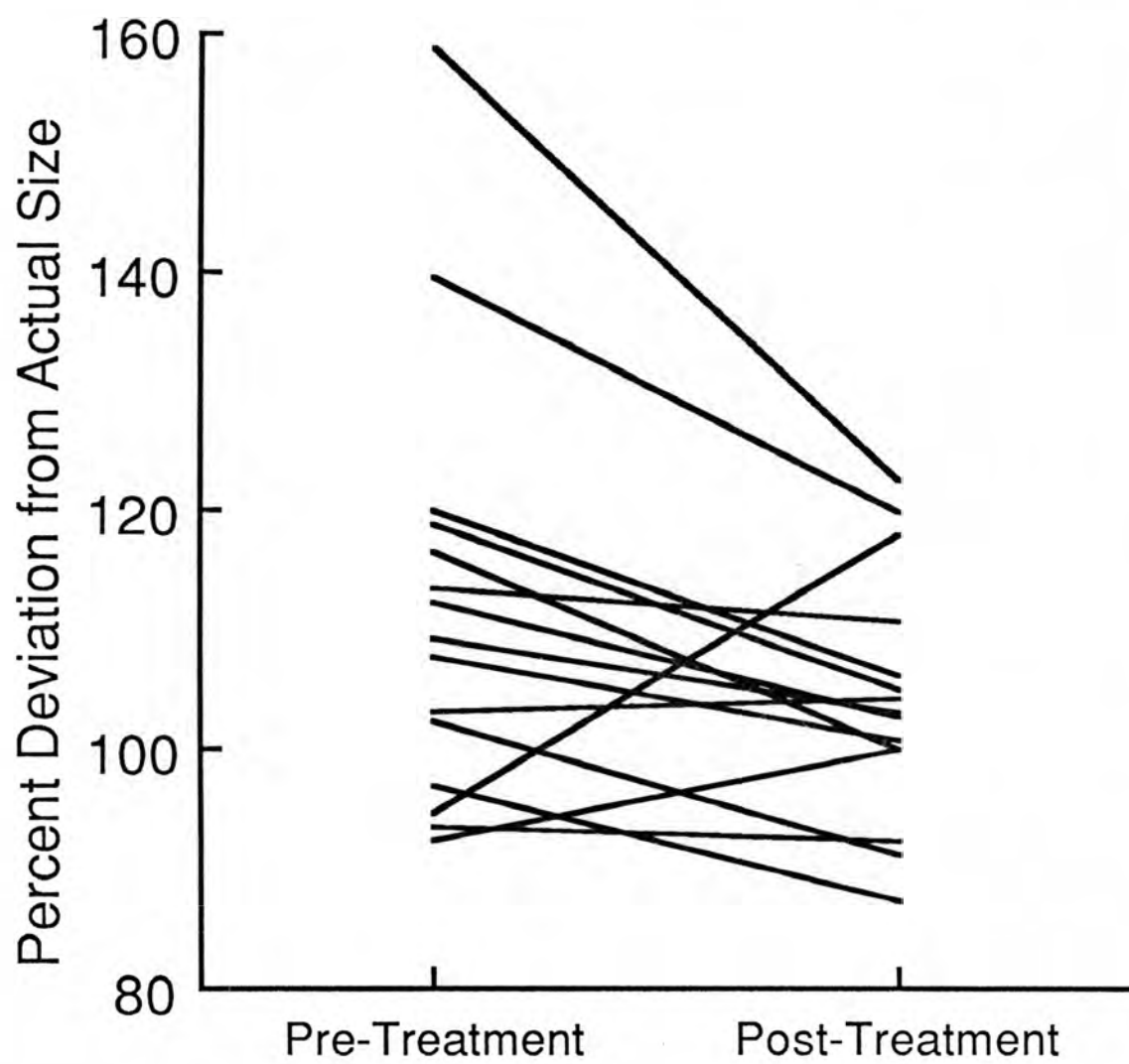


Table 5.3.3
Perceived size of patients and controls

	Patients (N=15) \bar{X}/sd	Controls (N=82) \bar{X}/sd	t	df	P
Before Treatment	111.9 18.0	105.8 14.2	1.48	95	>.05
After Treatment	104.3 10.2	105.8 14.2	0.40	95	>.05

Figure 5.3.2 shows that 12 of the 15 patients showed a larger desired size at the end of treatment compared with before. Using a t-test for matched samples, again this change was statistically significant (78.2%, $sd=15.4$ versus 86.5%, $sd=12.3$; $t=2.90$, $df=14$, $P<.02$). Table 5.3.4 shows that before treatment the desired size of the patients was significantly smaller than that of the control group, whereas after treatment the desired size of the two groups was similar.*

Table 5.3.4
Desired size of patients and controls

	Patients (N=15) \bar{X}/sd	Controls (N=82) \bar{X}/sd	t	df	P
Before Treatment	78.2 15.4	91.1 11.7	3.75	95	.001
After Treatment	86.5 12.3	91.1 11.7	1.40	95	>.05

Figure 5.3.3 shows that 13 of the 15 patients showed a decrease in body size dissatisfaction. Again, this change was statistically significant (33.7%, $sd=28.4$ versus 17.8%, $sd=17.7$; $t=4.11$, $df=14$, $P<.001$). Table 5.3.5 shows that before treatment the patients were significantly more dissatisfied with their size compared with the controls, whereas at the end of treatment the two groups showed similar levels of dissatisfaction.

* The sample of women assessed twice over a ten week period reported in Appendix 23 showed no significant change in perceived body size or desired size ($t=1.05$ and $t=0.61$ respectively; $P>.05$); and therefore the changes observed in the patient sample over treatment cannot be attributed simply to retesting.

Figure 5.3.2
Change in desired size following treatment for bulimia nervosa

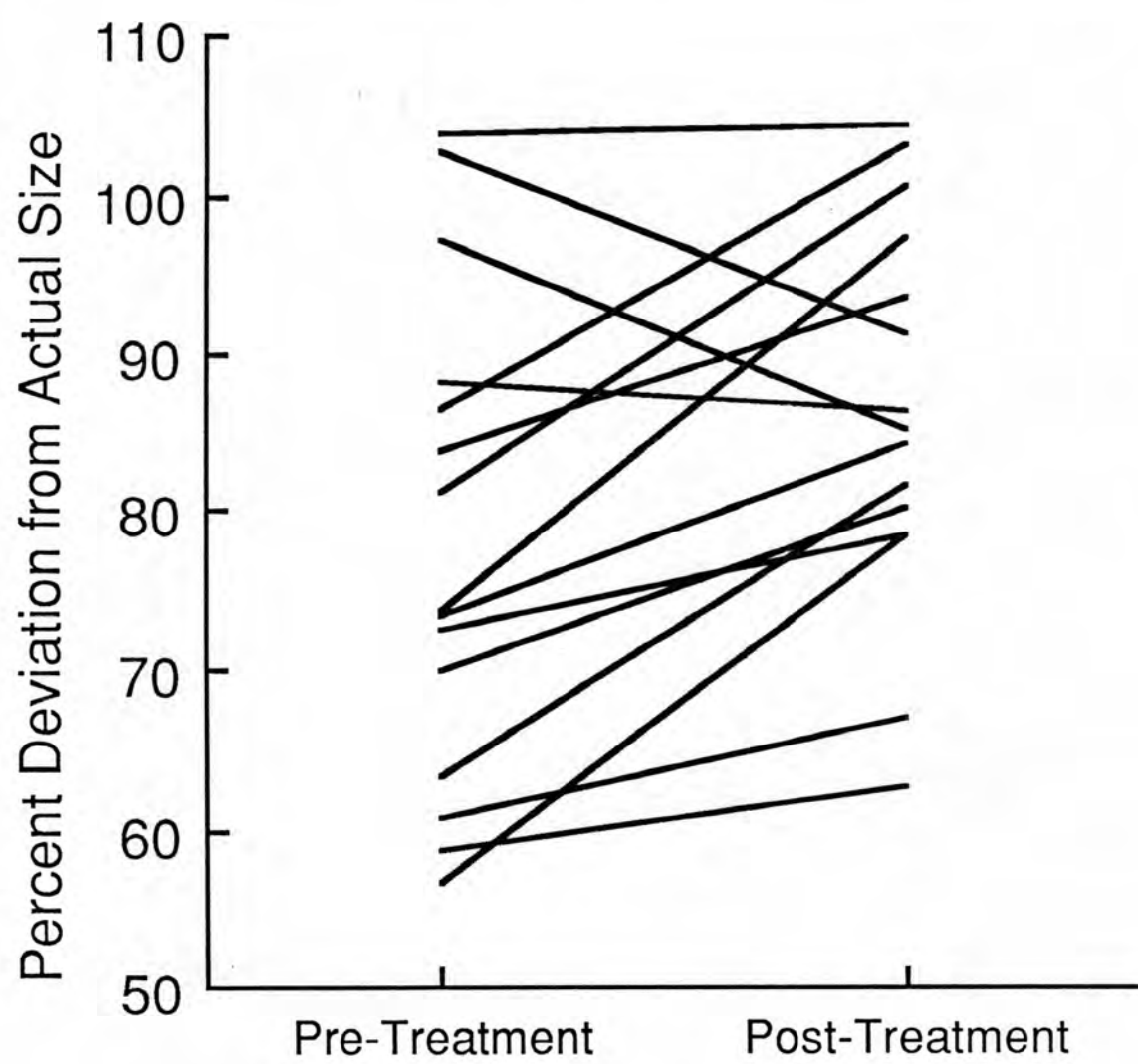


Figure 5.3.3
Change in body size dissatisfaction following treatment for bulimia nervosa

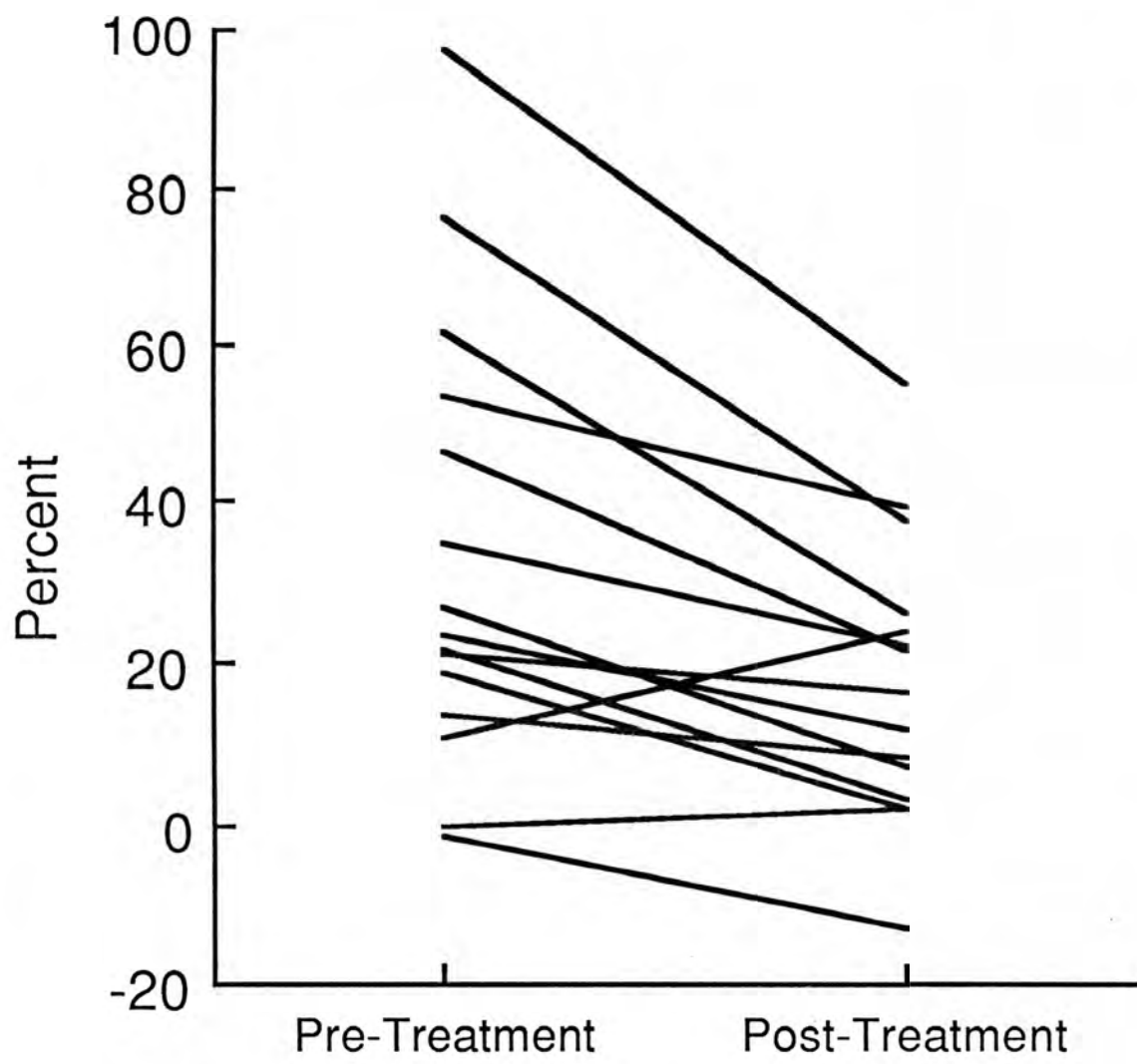


Table 5.3.5
Body size dissatisfaction for patients and controls

	Patients (N=15) \bar{x}/sd	Controls (N=82) \bar{x}/sd	t	df	P
Before	33.7	14.7	2.54	15.3	.02
Treatment	28.4	14.3			
After	17.8	14.7	0.75	95	>.05
Treatment	17.7	14.3			

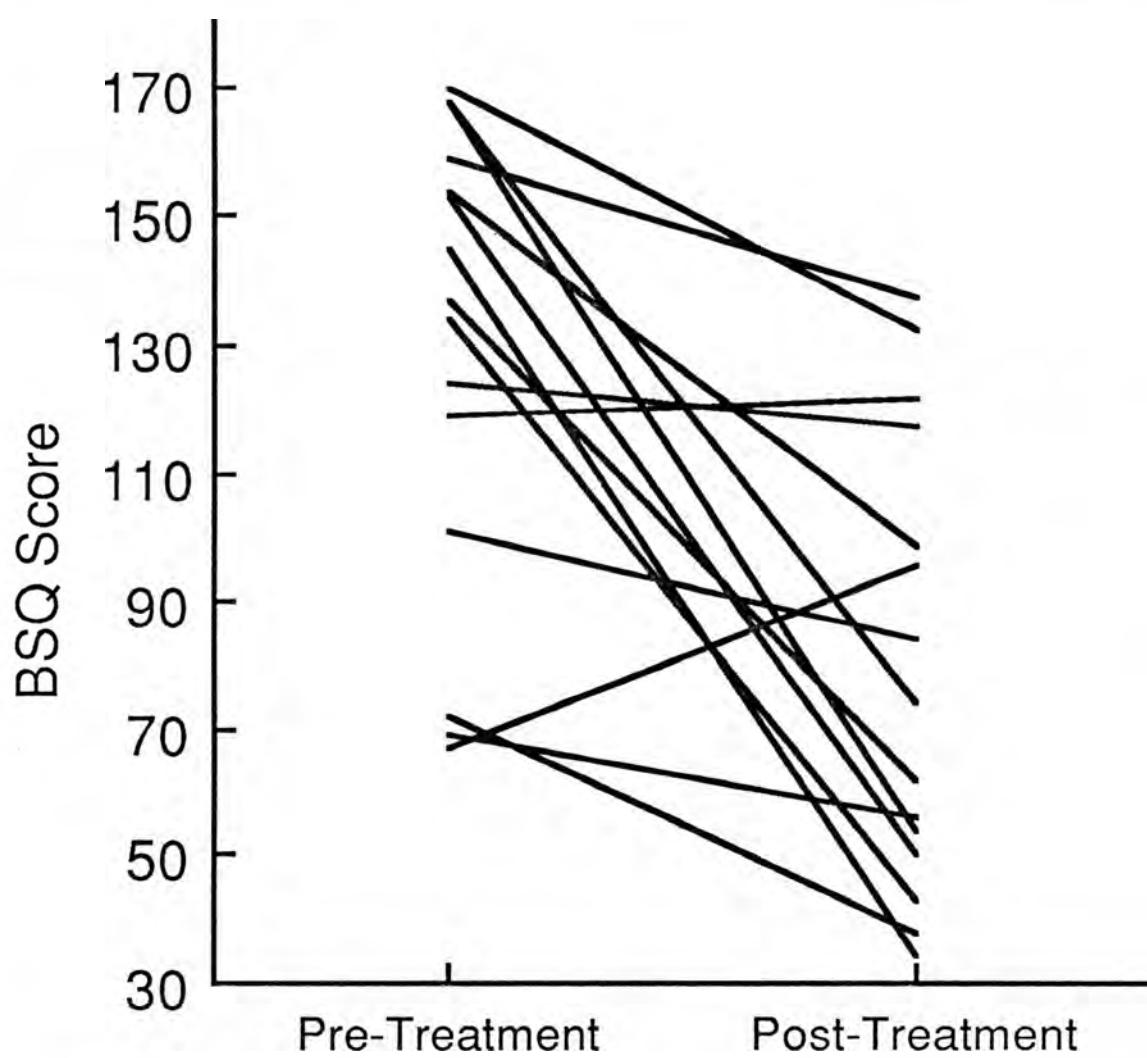
Figure 5.3.4 shows that 13 patients showed a decrease in their score on the BSQ. (It is noteworthy that the one patient who showed a substantial increase in her score also gained a stone in weight during treatment, which was a much greater increase than any other patient.) The decrease in BSQ scores was highly significant (129.3, $sd=36.6$ versus 78.4, $sd=35.3$; $t=4.23$, $df=14$, $P<.001$). Table 5.3.6 shows that before treatment the patients scored considerably higher on the BSQ compared with the controls, whereas at the end of treatment the patients and controls scored similarly on this questionnaire.

Table 5.3.6
BSQ scores of patients and controls

	Patients (N=15) \bar{x}/sd	Controls (N=82) \bar{x}/sd	t	df	P
Before	129.3	88.8	4.74	95	.001
Treatment	36.6	29.2			
After	78.4	88.8	1.23	95	>.05
Treatment	35.3	29.2			

Thus, on all three measures of body size perception and the measure of concern with shape, the patients showed significantly less disturbance after treatment compared with before. Before treatment they showed greater disturbance on these measures compared with the control group

Figure 5.3.4
Change in concern with shape following treatment for bulimia nervosa



(although for perceived body size this did not reach statistical significance), whereas after treatment the patients were similar to the controls on these measures.

Change in body size perception in relation to concern with shape

In order to examine change in body size perception in relation to change in concern with shape it was necessary to derive indices of change. Measures of change in perceived size, body size dissatisfaction and score on the BSQ were obtained by subtracting post-treatment scores from pre-treatment scores. A measure of change in desired size was derived by subtracting desired size at the start of treatment from desired size at the end of treatment. Table 5.3.7 shows relationships between change in body size perception and concern with shape using Spearman's rank correlation coefficient. Although a change in perceived size was unrelated to a change in the BSQ score, an increase in desired size and a decrease in body size dissatisfaction were significantly associated with a decrease in BSQ score.

Table 5.3.7
Change in body size perception in relation to change in concern with shape

	Change in Perceived Size	Change in Desired Size	Change in Body size Dissatis- faction
	Spearman's r		
	r / P	r / P	r / P
Change in BSQ Score	.14 >.05	.70 .01	.73 .001

Thus, an improvement on two of the three measures of body size perception was associated with a reduction in a high level of concern with shape.

Change in relation to change in mood

A measure of change in level of depression was derived by subtracting score on the BDI at the end of treatment from score on the BDI at the start of treatment. Table 5.3.8 shows the relationship between change in body size perception and concern with shape in relation to change in depressed mood. An improvement in mood was significantly associated with a decrease in body size dissatisfaction and with an increase in desired size, and was highly related to a decrease in level of concern with shape. Although a decrease in body size overestimation tended to be

associated with an improvement in mood, this did not reach statistical significance.

Table 5.3.8
Change in body image in relation to change in mood

	Change in Perceived Size	Change in Desired Size	Change in Body size Dissatisfaction	Change in BSQ score
	Spearman's r			
	r/P	r/P	r/P	r/P
Change in BDI score	.33 >.05	.57 .02	.74 .001	.85 .001

Thus, an improvement in mood was associated with an improvement in body image disturbance.

Change in relation to outcome from the eating disorder

Based on the post-treatment assessment, two measures of outcome were derived:

(1) Absolute Outcome

- (a) Patients who had binged or vomited no more than once over the past month were deemed to have made a *good* recovery;
- (b) Patients who had binged or vomited between two and four times over the past month were deemed to have made a *moderate* recovery;
- (c) Patients who had binged or vomited more than four times over the past month were deemed to have made a *poor* recovery.

This measure of outcome from bulimia nervosa has been used by other researchers (eg. Fairburn et al,1985). One problem with this measure was that patients who before treatment had binged or vomited many times each month may have markedly improved by the end of treatment but may still have been rated to have had a poor response to treatment. The second measure of outcome overcame this problem:

(2) Relative outcome

Frequency of bingeing and vomiting at the end of treatment were expressed as a percentage reduction based on pre-treatment frequency:

- (a) Patients who showed at least a 75 percent reduction in frequency of bingeing and vomiting were deemed to have made a *good* recovery;
- (b) Patients who showed at least a 50 percent but less than a 75 percent reduction in frequency of bingeing and vomiting were deemed to have made a *moderate* recovery;
- (c) Patients who showed less than a 50 percent reduction in frequency of bingeing and vomiting were deemed to have made a *poor* recovery.

This measure of outcome was adapted from one reported elsewhere (Pope et al,1983).

Using the first measure of outcome, seven patients achieved a good recovery from the eating disorder, two a moderate recovery, and six a poor recovery. Using the second measure, nine patients made a good recovery, three a moderate recovery, and three a poor recovery. When drawing comparisons between outcome categories, due to the small numbers of patients who made a moderate recovery these patients were considered with patients who made a poor recovery.

Pre-treatment measures in relation to outcome

(1)

Table 5.3.9 shows absolute outcome from the eating disorder in relation to pre-treatment measures of body size perception and concern with shape. Using the Mann-Whitney U-test, patients who achieved a good recovery scored similarly on these measures compared with patients who achieved only a moderate or poor recovery.

Thus, pre-treatment measures of body size perception and concern with shape were unrelated to absolute outcome from the eating disorder.

Table 5.3.9
Relationships between pre-treatment measures and absolute outcome
From the eating disorder

	Mean Ranks		Z	P
	Poor or Moderate Recovery (N=8)	Good Recovery (N=7)		
Perceived Size	8.38	7.57	0.35	>.05
Desired Size	8.13	7.86	0.12	>.05
Body size Dissatisfaction	7.63	8.43	0.35	>.05
BSQ score	7.31	8.79	0.64	>.05

(2)

Table 5.3.10 shows relative outcome from the eating disorder in relation to pre-treatment measures of body size perception and concern with shape. Using the Mann-Whitney U-test, similar to absolute outcome, pre-treatment measures of body size perception were unrelated to relative recovery from the eating disorder. However, compared with patients who made a poor or moderate recovery, those who achieved a good recovery scored significantly higher on the BSQ at the start of treatment.

It was conceivable that the association between a high level of concern with shape at the start of treatment and a good outcome from the eating disorder was mediated by a recent onset of the illness. Although little is known about the prognosis of bulimia nervosa, a recent onset of the disorder anorexia nervosa has been associated with a good recovery (eg. Morgan and Russell, 1975), and in Section 1 of this Chapter a recent onset of bulimia nervosa was associated with a particularly high level of concern with shape. It was therefore possible that a high BSQ score at the start of treatment predicted a marked improvement in disturbed eating behaviour because a high BSQ score was also associated with a short duration of illness. However, Table 5.3.10 shows that this was not the case. Patients who achieved a good recovery had suffered from bulimic episodes for as long as those who

achieved only a moderate or poor recovery.

Table 5.3.10
Relationships between pre-treatment measures and relative outcome
From the eating disorder

	Mean Ranks		Z	P
	Poor or Moderate Recovery (N=6)	Good Recovery (N=9)		
Perceived Size	7.00	8.67	0.71	>.05
Desired Size	9.50	7.00	1.06	>.05
Body size Dissatisfaction	6.17	9.22	1.30	>.05
BSQ score	5.00	10.00	2.12	.04
Duration of Bulimic episodes	9.92	6.72	1.41	>.05

Thus, pre-treatment measures of body size perception were unrelated to outcome from the eating disorder, but a high level of concern with shape before treatment predicted a good outcome from the eating disorder in terms of a marked reduction in the frequency of disturbed eating behaviour.

Post-treatment measures in relation to outcome

(1)

Table 5.3.11 shows absolute outcome from the eating disorder in relation to post-treatment measures of body size perception and concern with shape. Using the Mann-Whitney U-test, body size perception at the end of treatment was unrelated to absolute outcome from the eating disorder; but compared with patients who made a moderate or poor recovery, those who achieved a good recovery scored significantly lower on the BSQ at the

end of treatment.

Thus, body size perception at the end of treatment was unrelated to absolute outcome from the eating disorder, but a low level of concern with shape at the end of treatment was associated with a good outcome.

Table 5.3.11
Relationships between post-treatment measures and absolute outcome
From the eating disorder

	Mean Ranks			
	Poor or Moderate Recovery (N=8)	Good Recovery (N=7)	Z	P
Perceived Size	7.63	8.43	0.35	>.05
Desired Size	6.63	9.57	1.27	>.05
Body size Dissatisfaction	9.00	6.86	0.93	>.05
BSQ score	11.19	4.36	2.95	.01

(2)

Table 5.3.12 shows relative outcome from the eating disorder in relation to post-treatment measures of body size perception and concern with shape. Using the Mann-Whitney U-test, similar to absolute outcome, relative outcome from the eating disorder was unrelated to body size perception at the end of treatment; but patients who made a good relative recovery scored significantly lower on the BSQ compared with those who achieved only a moderate or poor recovery.

Table 5.3.12
Relationships between post-treatment measures and relative outcome
From the eating disorder

	Mean Ranks		Z	P
	Poor or Moderate Recovery (N=6)	Good Recovery (N=9)		
Perceived Size	6.67	8.89	0.94	>.05
Desired Size	7.17	8.56	0.59	>.05
Body size Dissatisfaction	8.50	7.67	0.35	>.05
BSQ score	11.17	5.89	2.24	.03

Thus, body size perception at the end of treatment was unrelated to outcome from the eating disorder, but a low level of concern with shape at the end of treatment was associated with a good outcome.

Change in relation to outcome

(1)

Table 5.3.13 shows change in body size perception and concern with shape in relation to absolute outcome from the eating disorder. Using the Mann-Whitney U-test, compared with patients who made only a moderate or poor recovery, those who achieved a good recovery showed a significantly greater decrease in their score on the BSQ, and tended to show a greater decrease in body size dissatisfaction and a greater increase in their desired size, although the two groups showed a similar degree of change in perceived size. These changes are illustrated in Figure 5.3.5.

Thus, a good absolute outcome from the eating disorder was associated with a reduction in concern with shape and body size dissatisfaction and an increase in desired size during treatment for the eating disorder.

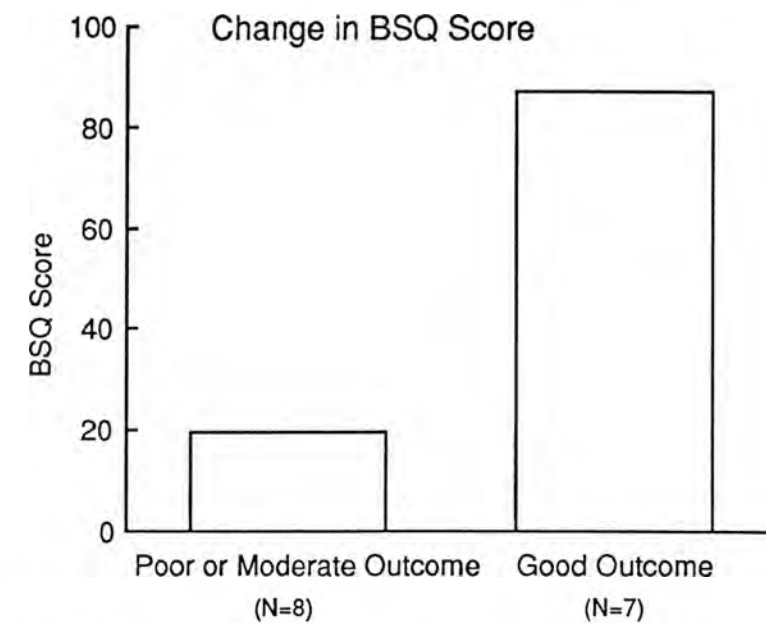
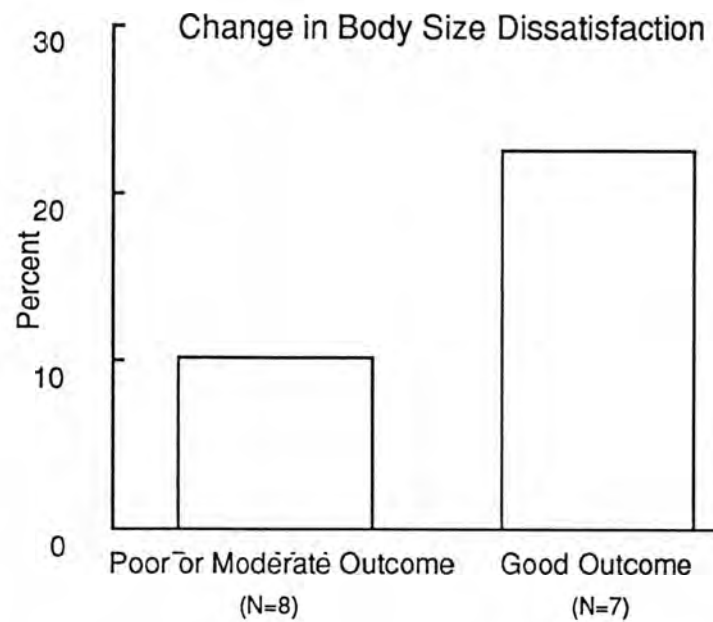
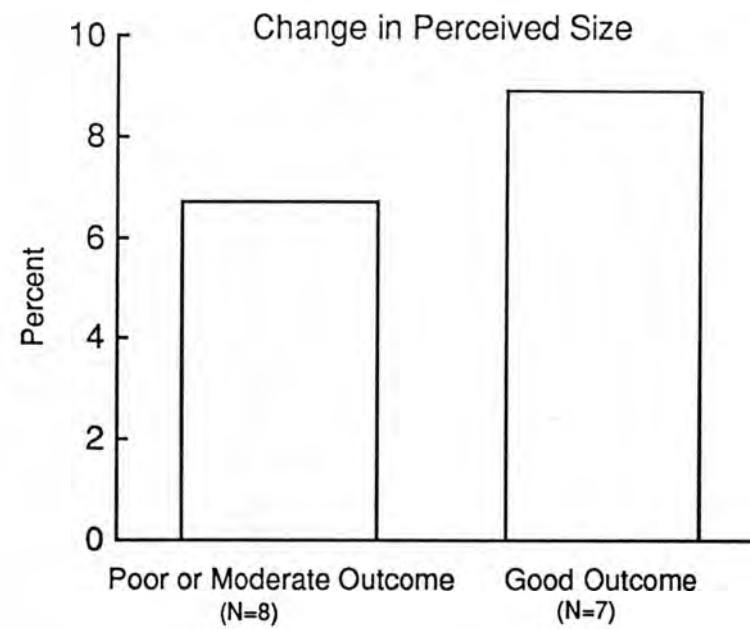


Figure 5.3.5
Change in body image in relation to absolute outcome from the
eating disorder

Table 5.3.13
Changes in body size perception and concern with shape in
Relation to absolute outcome from the eating disorder

Change	Mean Ranks		Z	P
	Poor or Moderate Recovery (N=8)	Good Recovery (N=7)		
Perceived Size	8.38	7.57	0.35	>.05
Desired Size	6.13	10.14	1.74	.09
Body size Dissatisfaction	6.25	10.00	1.62	>.05
BSQ score	5.13	11.29	2.66	.01

(2)

Table 5.3.14 shows change in body size perception and concern with shape in relation to relative outcome from the eating disorder. Using the Mann-Whitney U-test, similar to absolute outcome, compared with patients who made only a moderate or poor recovery, those who achieved a good recovery showed a significantly greater decrease in their score on the BSQ and in body size dissatisfaction, and a significantly greater increase in their desired size, although again the two groups showed similar changes in perceived size. These changes are illustrated in Figure 5.3.6.

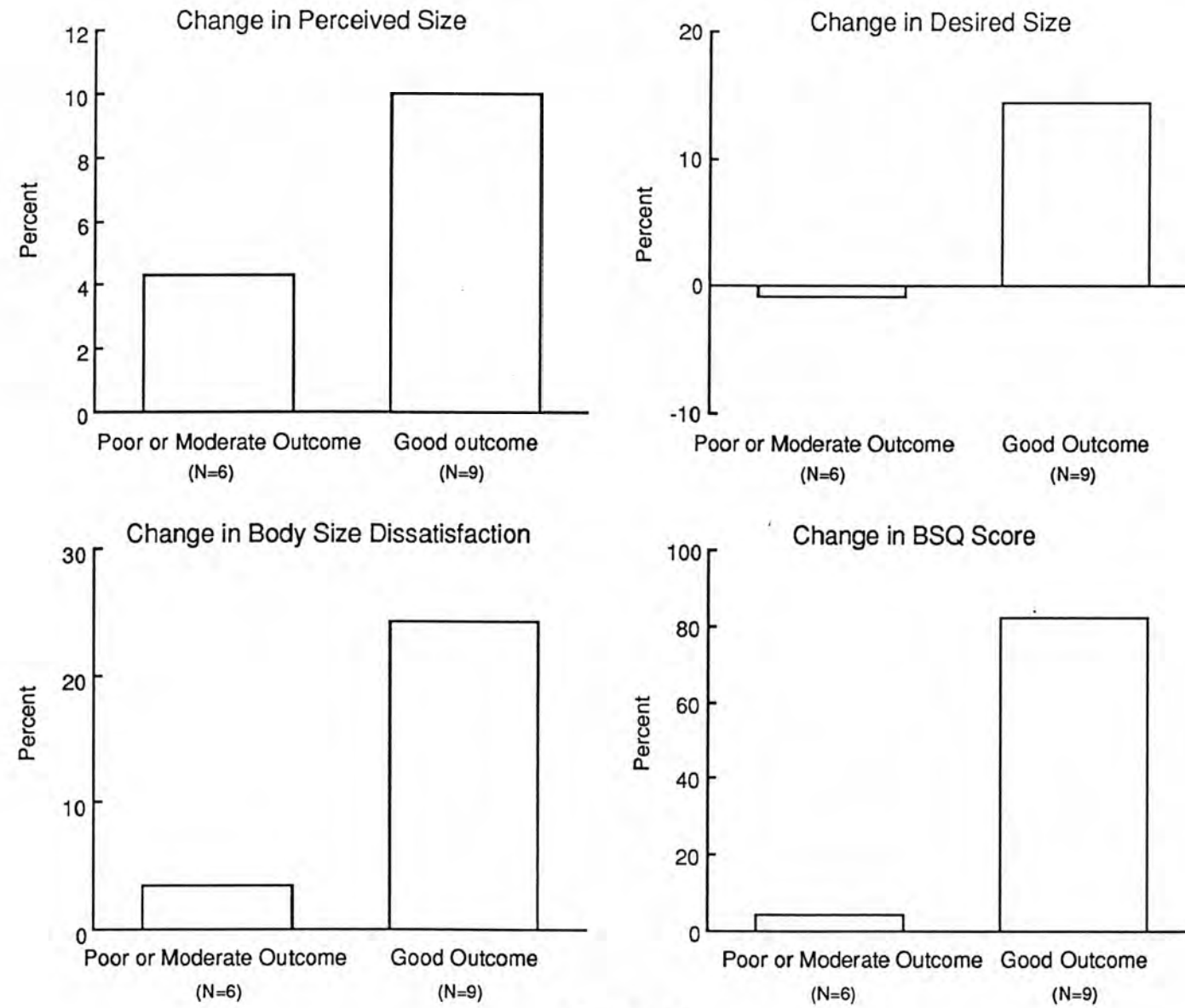


Figure 5.3.6
Change in body image in relation to relative outcome from the
eating disorder

Table 5.3.14
Changes in body size perception and concern with shape in relation
To relative outcome from the eating disorder

Change	Mean Ranks		Z	P
	Poor or Moderate Recovery (N=6)	Good Recovery (N=9)		
Perceived Size	7.33	8.44	0.47	>.05
Desired Size	4.17	10.56	2.71	.01
Body size Dissatisfaction	4.17	10.56	2.71	.01
BSQ score	3.50	11.00	3.18	.01

Thus, a marked improvement in disturbed eating behaviour was associated with a reduction in concern with shape and body size dissatisfaction and an increase in desired size, but was unrelated to a decrease in body size overestimation.

Change in weight

Although one patient showed an increase in her score on the BSQ and an increase in weight, Table 5.3.15 shows that for the complete sample of patients change in weight was unrelated to change in body size perception and concern with shape. Thus, the relationships between change in body size perception and concern with shape in relation to outcome from the eating disorder were not mediated by a change in weight.

Table 5.3.15
Relationships between change in weight with change in body size
Perception and concern with shape

	Change in Perceived Size	Change in Desired Size	Change in Body size Dissatisfaction	Change in BSQ score
	Spearman's r			
	r / P	r / P	r / P	r / P
Change in Weight	-.33 >.05	.17 >.05	.13 >.05	.18 >.05

Discussion

This study is the first to report body size perception and concern with shape before and after treatment for bulimia nervosa and to examine the significance of these factors in relation to outcome from the eating disorder. Fifteen patients who all satisfied Russell's (1979) criteria for bulimia nervosa were assessed on a standardised and validated measure of concern with shape and a measure of body size perception which has been shown to have a satisfactory degree of test re-test reliability and concurrent validity. No patient was currently in treatment at the first assessment, and the attrition rate from treatment was not high. Although the sample size is small it compares favourably with others in the field (eg. Norris, 1984; Touyz et al, 1985; Williamson et al, 1985).

Before treatment the patients tended to overestimate their size more than normal young women, preferred a thinner size, were markedly more dissatisfied with their body size and were markedly more concerned with their shape. During treatment overestimation, dissatisfaction and concern with shape significantly decreased and desired size significantly increased, and at the end of treatment patients were similar to controls on these measures. Thus, disturbance on these measures was markedly reduced by the end of treatment. Consistent with these findings, Birtchnell et al (1985) reported a significant decrease in overestimating the size of two out of three body parts following treatment for bulimia nervosa.

A *high* BSQ score at the start of treatment predicted a good outcome from the eating disorder in terms of a marked reduction in disturbed eating behaviour. While this finding must be interpreted with caution due to the small sample size, it suggests that a high level of concern with shape at the start of treatment may perhaps facilitate regaining control over eating. Conversely, a good outcome from the eating disorder was associated with a *low* BSQ score at the end of

treatment. Thus, patients whose disturbed eating behaviour markedly improved during treatment also showed a low level of concern with their shape at the end of treatment.

Body size perception before treatment was unrelated to outcome from the eating disorder. Thus, patients who initially showed a high level of disturbance on the three indices of body size perception were not necessarily likely to respond poorly to treatment. Similarly, body size perception at the end of treatment was also unrelated to outcome. Patients who made a poor recovery in terms of disturbed eating behaviour were not necessarily likely to show perceptual disturbances at the end of treatment. This finding must be considered in relation to the finding by Freeman and his colleagues (Freeman et al, 1985b) who reported that among patients who managed to regain control over their eating, a high level of body size dissatisfaction at the end of treatment predicted relapse six months later. It is therefore possible that, although a high level of dissatisfaction before or after treatment may not predict response to treatment, it may predict longer-term outcome.

Examining relationships between change in concern with shape and body size perception, a marked reduction in concern with shape during treatment was associated with a reduction in disturbances on two of the three indices of body size perception. Changes in desired size, body size dissatisfaction and concern with shape were in turn associated with an improvement in mood and disturbed eating behaviour. These relationships suggest that change on one measure of disturbance characteristic of bulimia nervosa is also associated with change on other measures of disturbance. Perceived body size was the exception to this finding, in contrast with the other two indices of body size perception, and it is unclear why improvement on this factor was unrelated to a reduction in concern with shape and an improvement in mood and disturbed eating behaviour. Possibly, the finding of no association between change in perceived size and change on other factors may have been due to the large range in estimations within a small sample size. The relationship between change in concern with shape and change in mood was similar to that found in women in the community (reported in Section 6 of Chapter 3). This relationship suggests that it would be worthwhile to study changes in mood and concern with shape among patients with anorexia nervosa who, similar to patients with bulimia nervosa, are characterised by mood disturbances which have been found to improve during treatment for the eating disorder (Eckert et al, 1982).

On a more cautious note, the findings from this study must be regarded as tentative since they were based on a small sample of patients. In particular, findings regarding outcome from the eating disorder are preliminary since the measures of outcome necessitated comparing very small numbers of patients. Nevertheless, there had been no other study conducted so intensively of change in body size perception and concern with shape following treatment for bulimia nervosa, and the preliminary findings reported are highly suggestive of meaningful change in these areas of disturbance which could have important implications for the long term outcome of these patients.

Chapter 6

General Discussion

General discussion

A disturbance in body image has long been recognised in the eating disorder anorexia nervosa and has more recently been discussed in relation to bulimia nervosa. However, the findings from studies which examined the nature and significance of this disturbance in these patients have been severely limited. Many studies have measured whether patients with eating disorders overestimate their size more than normal young women, but few have measured desired size and dissatisfaction with body size. This is an important omission since such dissatisfaction is possibly a more significant index of psychopathological disturbance than perceived body size *per se* (as was discussed in Chapter 1). Also, there has been little investigation into disturbances in body size perception in bulimia nervosa, and the few reports were all were unsatisfactory in a number of respects. There has been no systematic evaluation of the significance of body size perception, in terms of its relationship with other clinical features, response to treatment and outcome from the eating disorder. Although several studies have investigated factors related to body size overestimation in anorexia nervosa, there has been almost no research into the significance of body size dissatisfaction; and no study has examined satisfactorily whether similar factors may be related to disturbances in body size perception among patients with eating disorders and women in the community. This is surprising in view of the considerable overlap between the estimations made by patients with eating disorders and controls, suggesting that common factors may be associated with disturbances in body size perception among patients and non-patients. Finally, few studies have drawn a clear distinction between body size perception and concern with shape as aspects of body image. Making this distinction is essential for reaching an understanding of the nature and significance of body image disturbance. There has been virtually no research into concern with shape, either among patients with eating disorders or among women in the community.

A series of studies was conducted which aimed to overcome the problems and limitations associated with the published studies on body image. The nature and significance of body image disturbance was investigated further by examining body size perception and concern with shape among patients with eating disorders and women in the community.

The dearth of research into concern with shape was at least partly because there was no adequate measure of this aspect of the psychopathology of eating disorders. Therefore, the Body Shape Questionnaire (BSQ) was developed specifically to assess concern with shape. This sensitive measure consists of 34 self-report items which were empirically derived and which are endorsed on a frequency scale. The questionnaire showed a high degree of internal consistency, and concurrent and discriminant validity. It was designed not as a screening instrument for the detection of eating disorders, but rather as an interval measure of an important aspect of the specific psychopathology of such disorders, which could not previously be assessed systematically.

Concern with shape among women in the community

The BSQ was used to examine the significance of concern with shape in a large group of women in the community. Many were found to show some concern with their shape, but the level of such concern was usually mild compared with that experienced by most patients with bulimia nervosa. Among women in the community a relatively high level of concern with shape was found to arise at a young age and was associated with a disturbed weight history, dieting and disturbed eating attitudes and behaviour. In view of the associations between a young age, disturbed eating behaviour and a high level of concern with shape, it is possible that a high level of such concern at a young age may predict future problems with eating. It would be interesting to identify young girls who show a high level of concern with their shape and observe whether they later develop problems with eating. Should this prove the case, it would be important to attempt to identify factors which predict the development of this concern, thereby suggesting ways of averting its development.

Among women in the community, an important finding was the association between concern with shape and depressed mood, although such concern was unrelated to a poor general mental state. Minor changes in mood accompanying phase of the menstrual cycle were not found to be associated with changes in concern with shape; but among women for whom concern with shape was found to be labile, changes in concern with shape were associated with concurrent changes in mood. This finding suggests that concern with shape and mood are closely linked, and that a disturbance in one of these factors may exacerbate a disturbance in the other. Although the association does not indicate a causal relationship, it is consistent with ideas in Beck's cognitive model of depression, as was discussed in Chapter 1. Beck (1973) suggested that, among women, depressed mood often leads to concern with fatness and perceiving oneself as fat.

Body size perception in women in the community

Turning to the other aspect of body image, body size perception, a series of studies was conducted to examine whether factors which have been reported to be related to disturbances in body size perception in patients with eating disorders, may be associated with similar disturbances in non-patients. Among young women in the community, body size overestimation and body size dissatisfaction were found to be related to depressed mood and a high level of concern with shape; and these relationships were found to be stronger among women who were highly concerned with their shape. An hypothesis was outlined, which suggested that negative self-appraisal, as a symptom of depressed mood, may lead to disturbances in body size perception, particularly among women who place great importance on body shape. As a rigorous test of this hypothesis, a mood induction study was conducted in the laboratory to determine whether depressed mood may exacerbate disturbances in body size perception. Small but significant changes in mood were induced in a sample of normal young women, and body size perception was measured before and after a change in mood. The hypothesis was partly supported: compared with a control group, body size overestimation and body size dissatisfaction increased more

following the induction of low mood. Furthermore, these changes in body size perception tended to be greater among women who were concerned with their shape than among women who showed little concern. Again, these findings were consistent with the ideas in Beck's cognitive model of depression discussed above. The results from the mood induction study support the hypothesis that negative self-appraisal may exacerbate body size overestimation and body size dissatisfaction, particularly among women who are highly concerned with their shape. Thus, the findings from the studies of body size perception in women in the community suggest that depressed mood and a high level of concern with shape, which characterise patients with eating disorders and which have been reported to be associated with disturbances in body size perception among these patients, may give rise to similar disturbances among women in the community. Such findings would appear partly to explain why disturbances in body size perception are common among patients with eating disorders but are also found among women in the community.

The observed relationship between depressed mood and disturbances in body size perception suggests that a study of body size perception in women with high levels of naturally occurring depression would be worthwhile. The findings from the series of studies presented above suggest that among women who place a high value on a slim body shape, the onset of depression would exacerbate both disturbances in body size perception and concerns with body shape; and that treatment which successfully alleviated the depression would also alleviate these disturbances in body image.

Concern with shape in bulimia nervosa

In view of the inadequate nature of the published research into body image disturbance in bulimia nervosa, such a disturbance was evaluated in a series of patients suffering from this disorder. Most were found to show a high level of concern with their shape; and a particularly high level of such concern was associated with a number of indices which characterise the disorder. The relationships between concern with shape and other clinical features of bulimia nervosa were associations only, and did not indicate a causal relationship. Nevertheless, it is possible to speculate about the implications of these findings. The associations observed between concern with shape, dieting, vomiting and laxative abuse suggest that the high level of concern with shape typically shown by these patients may encourage this maladaptive behaviour in order to reduce the concern with fatness. The disturbed eating behaviour may in turn encourage gross overeating¹ for two reasons. First, the reduction in anxiety about fatness which follows vomiting (Rosen and Leitenberg, 1982) may disinhibit dietary restraint and lead to overeating. Second, there is evidence to suggest that dietary restraint may precipitate overeating (Herman and Mack, 1975). Gross overeating will in turn intensify concern with shape, and thus a maladaptive

¹ Although frequency of bulimic episodes was not found to be significantly associated with concern with shape among patients with bulimia nervosa, since all experienced bulimic episodes and the great majority showed a high level of concern with shape, there may have been insufficient variability on these two factors for them to be related.

cycle is established. An adaptation of a model proposed by Fairburn and his colleagues (Fairburn et al, 1986a) illustrates these relationships (Figure 6.1). The reduction in concern with shape which accompanied the improvement in disturbed eating behaviour among those patients treated for the eating disorder suggests that improvement in one area of disturbance may facilitate improvement in other areas.

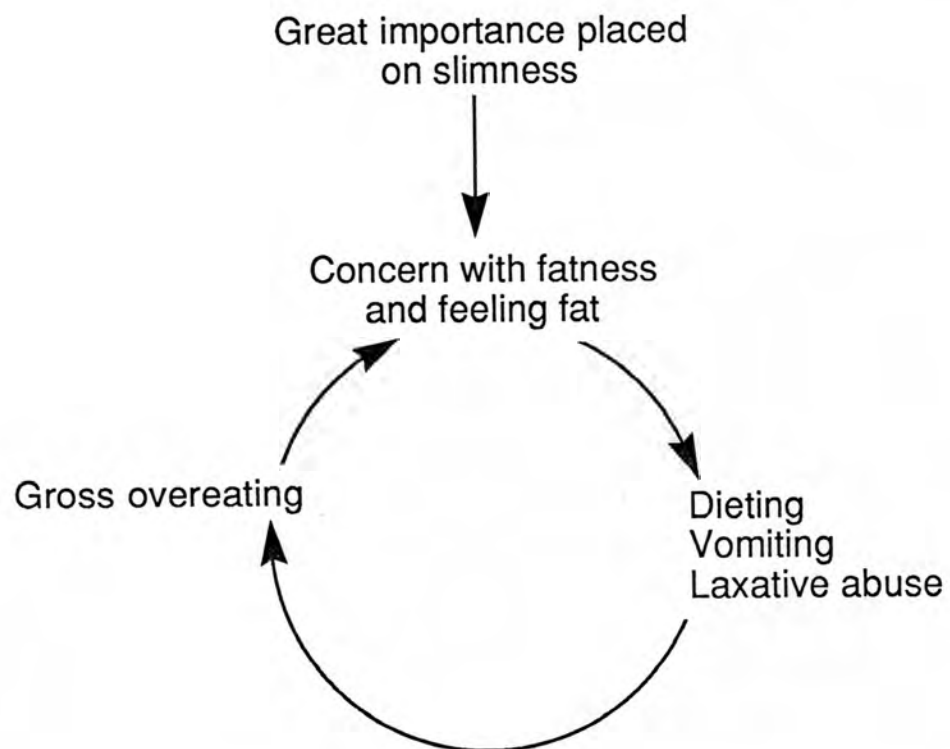
Similar to women in the community, among the patients with bulimia nervosa, in addition to disturbed eating attitudes and behaviour, a high level of concern with shape was also found to be related to depressed mood; and with general self-depreciatory feelings. Furthermore, change in concern with shape during treatment for the eating disorder was highly associated with a concurrent change in mood. As above, these findings are consistent with Beck's (1973) suggestion that depressed mood may exacerbate concern with shape and feelings of fatness.

It is important to examine whether the relationship between changes in mood and concern with shape found among patients with bulimia nervosa and women in the community obtains among patients with anorexia nervosa. Two intensive case studies were conducted to investigate the relationship between body image and mood among patients suffering from this disorder (see Appendix 30). Despite very different outcomes from anorexia nervosa in terms of concern with shape, mood and disturbed eating attitudes and behaviour, for both patients an association was found between changes in concern with shape and mood.

Body size perception in bulimia nervosa

Although there have been several published reports on body size overestimation in patients with bulimic disorders, these are all methodologically unsatisfactory in a number of respects (as was reviewed in Section 2 of Chapter 5). Therefore, a series of patients with bulimia nervosa was compared on body size perception with a large group of normal young women. The patients were found to overestimate their size significantly more than the controls, and, despite being similar to the controls in terms of actual size, they wished to be much thinner and were markedly more dissatisfied with their body size. Thus, the patients were characterised by a high level of disturbance on all three perceptual indices. Examining the significance of these disturbances, body size overestimation and body size dissatisfaction were found to be associated with a high level of psychopathological disturbance. Of particular note, these included feelings of self-deprecation and a high level of concern with shape. Thus, for these patients the two components of body image were significantly related. Among patients treated for the eating disorder, disturbances on all three measures of body size perception (ie. perceived size, desired size and body size dissatisfaction) were found to decrease significantly during treatment; and for desired size and body size dissatisfaction these improvements were associated with an improvement in general clinical state including a decrease in concern with shape and an improvement in mood. Concurrent changes on these factors suggests that the inter-relationships between them may be important in the maintenance of these areas of disturbance.

Figure 6.1
A model of the maintenance of disturbed eating behaviour



Thus, among patients with bulimia nervosa, concern with shape and disturbances in body size perception were found to be related to behavioural disturbance and psychological distress, and change on these factors was associated with a change in general clinical state. The relationships found between disturbances in body size perception, concern with shape and outcome from the eating disorder suggest that recovery in terms of disturbed eating behaviour may be promoted by treating the body image disturbance. Very little has been reported on the treatment of such disturbance. Indeed, only one study reported therapy aimed specifically at modifying body image (Wooley and Kearney-Cooke, 1986). However, the findings from this study are difficult to interpret for methodological reasons (discussed in Section 3 of Chapter 5). Twenty-five years ago Bruch (1962) suggested that *a realistic body image is a precondition to recovery* from anorexia nervosa; and Fairburn and his colleagues (Fairburn et al, 1986a) recently suggested that a change in maladaptive beliefs about shape may be necessary for a full and lasting recovery from an eating disorder. In view of these suggestions it is surprising that so little attention has been devoted to the treatment of body image in eating disorders. In the study reported above, body image disturbance in bulimia nervosa was found to be meaningfully related to other central features of the psychopathology; and this suggests that improvement in the body image disturbance may have beneficial effects on other symptoms. Garfinkel and Garner (1982b), in discussing body image disturbance in anorexia nervosa, conclude that it is difficult to treat; and they advise that, instead of trying to correct disturbances in body size perception and reduce feelings of fatness, therapy should aim at teaching patients ways of coping with these disturbances by re-interpreting maladaptive concerns with shape and distorted perception. Given that there has been so little research in this area, this seems a rather pessimistic conclusion, and the treatment of body image disturbance merits further exploration. Possible ways of treating body image disturbance include exposure to body shape, such as by encouraging a patient to use communal changing rooms with mirrors, and swimming pools; confronting a patient with her perceived image and her veridical image during therapy; and helping a patient devise cognitive strategies for coping with maladaptive attitudes towards her shape and distorted perception of her body size, similar to those discussed by Garfinkel and Garner (1982b) - for example, by encouraging the patient to rely on objective measures of her body size rather than subjective perception. To date, none of these therapeutic strategies has been investigated systematically.

The study of body image disturbance in bulimia nervosa raises further questions about the nature and significance of a similar disturbance in anorexia nervosa. Although there has been considerable research into body size overestimation in anorexia nervosa as mentioned above, very little has been reported on body size dissatisfaction among these patients; and there has been no satisfactory research into concern with shape. In view of similarities in the psychopathology of bulimia nervosa and anorexia nervosa, it would be informative to compare the level of concern with shape shown by patients with the bulimic and restricting subtypes of anorexia nervosa. The relationship between concern with shape and weight needs to be investigated among patients with

anorexia nervosa. Since a low weight was found to be associated with a low level of concern with shape among patients with bulimia nervosa and women in the community, it would appear relevant to examine the level of such concern experienced by severely underweight patients with anorexia nervosa over the course of weight restoration. Preliminary results from the two single case studies reported in Appendix 30 suggest that weight restoration may exacerbate concern with shape and disturbances in body size perception among some patients. Clearly, further research is required on a large sample of patients with anorexia nervosa to address this question.

Conclusion

The series of studies reported in this thesis attempt to address the limitations of the research into the nature and significance of body image disturbance highlighted at the beginning of this Discussion. In particular, the assessments of disturbances in body size perception and concern with shape in patients with bulimia nervosa were refined; and the significance of similar disturbances as they arise among non-patient women was investigated. An important association between body image disturbance and depressed mood consistently emerged among patients with eating disorders and women in the community. The findings from the series of studies reported have important implications for the understanding of body image disturbance in the eating disorders, as well as possible implications for treatment.

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Appendices

Appendix 1

Research Diagnostic Criteria For Anorexia Nervosa

Russell's Criteria (1970)

- (1) The patient's behaviour leads to a marked loss of body weight¹ and malnutrition. The abnormal behaviour consists of a studied and purposive avoidance of foods considered to be of a 'fattening nature', usually carbohydrate-containing foods such as sugar, bread and cereals, potatoes, pastries and confectionery. Often, but not invariably, the patient resorts to additional devices which ensure a loss of weight: self-induced vomiting or purgation, or excessive exercise. Occasionally a patient may indulge in bouts of overeating but these are usually compensated for by subsequent vomiting or prolonged starvation which effectively counteract the transient increase in the caloric intake.
- (2) There is an endocrine disorder which manifests itself clinically by cessation of menstruation in those patients who are most commonly afflicted by the illness - adolescent girls or women during the reproductive period of life. The amenorrhoea is an early symptom and may precede the onset of weight loss; it is often very persistent and may last for several years.

In male subjects the equivalent symptom is a loss of sexual interest and lack of potency, but in adolescent boys it may be difficult to elicit these symptoms. In them, it is desirable to establish by means of hormone assays evidence for the hormonal disturbance which will be discussed later.

- (3) There are aspects of the psychopathology which are characteristic of anorexia nervosa, irrespective of the patient's sex. They are essentially manifestations of a morbid fear of becoming fat, which may be fully expressed by the patient or may be more explicit in her behaviour. To safeguard herself against what the patient often calls 'losing control' - meaning not being able to stop eating - she strives to remain abnormally thin. She defends her attitude by asserting that to be thin is for her right and desirable, and she often appears to be absolutely convinced of the justification of her ideas. She loses all judgement as to her requirements for food and may protest that she is eating satisfactorily; she often overestimates her body weight and sets herself a precise weight, above which she dare not rise.

There are, in addition, greatly varying psychopathological manifestations, especially depressive symptoms, but also obsessional, hysterical or phobic symptoms.

¹ A weight loss of 25lb or more has been stipulated but this figure obviously should be modified according to the patient's weight before the onset of the illness and the body build.

Criteria of Feighner et al (1972)

For a diagnosis of anorexia nervosa, A through E are required.

- (A) Age of onset prior to 25.
- (B) Anorexia with accompanying weight loss of at least 25 percent of original body weight.
- (C) A distorted, implacable attitude towards eating, food, or weight that overrides hunger, admonitions, reassurance and threats; eg. (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, 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) Amenorrhoea. (2) Lanugo. (3) Bradycardia (persistent resting pulse of 60 or less) (4) Periods of overactivity. (5) Episodes of bulimia. (6) Vomiting (may be self-induced).

DSM III Criteria (American Psychiatric Association, 1980)

- (A) Intense fear of becoming obese, which does not diminish as weight loss progresses.
- (B) Disturbance of body image, eg. claiming to "feel fat" even when emaciated.
- (C) Weight loss of at least 25 percent 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 percent.
- (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.

Appendix 2

Research Diagnostic Criteria For Bulimic Disorders

Russell's Criteria for Bulimia Nervosa (1979)

The criteria which should all be satisfied in bulimia nervosa are that:

- (1) The patients suffer from powerful and intractable urges to overeat;
- (2) They seek to avoid the 'fattening' effects of food by self-induced vomiting or abusing purgatives or both;
- (3) They have a morbid fear of becoming fat.

DSM III Criteria for Bulimia (American Psychiatric Association, 1980)

- (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.

DSM III-R Criteria for Bulimic Disorder (A.P.A., 1987)

- (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) During the eating binges there is a feeling of lack of control over the eating behaviour.
- (C) The individual regularly engages in either self-induced vomiting, use of laxatives, or rigorous dieting or fasting in order to counteract the effects of the binge-eating.

(D) A minimum average of two binge-eating episodes per week for at least three months.

(E) Persistent overconcern with shape and weight.

Appendix 3

Body Shape Questionnaire Interview

Many women feel fat at times and have negative feelings about their body. I am trying to understand this phenomenon in more detail, and am asking people a number of questions about it.

Do you sometimes feel fat?

What is this feeling like?

What does this feeling consist of?

Are there particular thoughts which go through your mind when you feel fat, such as specific phrases or sentences?

Do you feel this about your whole body, or about certain parts of your body?

When you feel fat does it concern your:

face

arms above the elbow

waist

stomach

hips

buttocks

thighs

calves

any where else

And what precisely are the thoughts you have about (body part)?

Do you have other negative feelings or thoughts about your body? (eg. about being unattractive or ugly?)

Are you ever unhappy about the relative proportions of your body?

What is it about feeling fat that (their words: eg. upsets) you in this way?

Why does it (upset) you?

(examples with which to prompt the subject)

Some people are concerned about fat showing, or bulges showing through their clothes. Is this something that concerns you?

If they feel fat, some people don't like the texture of their body. They feel that their flesh is not firm, that their flesh wobbles, or that their flesh is too dimply. Do you ever feel this way?

Some people say that when they feel fat they are concerned about their body taking up too much space. They are worried that they will not fit between spaces such as doorways, or barriers, or won't fit into chairs such as cinema seats. Do you ever feel this way?

Are there any particular circumstances which are likely to make you feel fat, or provoke these negative feelings about your body?

Do(the circumstances given by the subject) always provoke negative feelings about your body shape, or do the feelings occur only sometimes?

(If only sometimes) Why?

Does a small increase in weight make you feel fat?

How small an increase makes you feel this way?

If the clothes you are wearing fit tighter than usual, does this make you feel fat?

Would any of the following make you feel fat?

being in the bath or shower

seeing yourself in a mirror or shop window

certain times during the menstrual cycle

Do any social situations make you feel fat? What about:

being with women thinner than yourself

being with certain men

using communal changing rooms

wearing a bathing suit, or other revealing clothing

Do food related situations ever make you feel fat?

Do you ever feel fat after eating?

Does the quantity or type of food influence how you feel about your body shape?

Do even innocuous comments about your appearance make you feel fat? Like what?

Do emotional feelings ever make you feel fat? You may feel miserable or anxious about something in life aside from your weight or shape, such as your work or relationships with your family. What about feeling bored, or tired? Do any of these make you feel fat?

When you feel fat, how much does it affect your behaviour?

Do you carry on as usual, or does it affect what you might otherwise do?

Does it affect:

going out

meeting people

talking to people

your general self-confidence

the way you dress

Does feeling fat affect your eating?

Do you eat more, or less, or eat different sorts of food?

Does feeling fat affect your concern about how much you weigh?

Do you weigh yourself more/less often than usual?

Does feeling fat affect you in any other way?

You have described feeling fat and how it affects your life. Can you tell me how often you feel this way?

How often do you have these thoughts or feelings about.... (subject's own words)?

How long do these thoughts or feelings usually last?

How strongly do you feel these things?

Do these thoughts or feelings vary in intensity?

Appendix 4

Topics eliminated in the development of the BSQ

If something upsetting happens I tend to blame it on my shape.
After eating I immediately feel as if everything I have eaten puts weight on my hips, thighs and bottom.
I never feel good about my body; at best, I think it is O.K.
Feeling lonely can make me think about my shape and feel fat.
Feeling nervous about something can make me feel fat.
Having no exercise makes me feel fat.
I feel fat and bloated just before my menstrual period.
I feel slimmer when my skin is tanned.
If my body shape was O.K. what I weigh would still be important.
Any increase in weight makes me feel fat.
Any decrease in weight makes me feel slimmer.
Feeling fat makes me more worried about what I weigh.
When I feel fat I weigh myself more often than usual.
When I feel fat I avoid weighing myself.
I feel bad about my shape even when I am with women fatter than myself.
I feel less conscious about my body shape when I am with my closest friends.
I feel more self-conscious about my shape when I am with strangers.
Wearing tight clothes makes me feel fat.
I feel fat if my normal clothes fit tighter than usual, even if they shrink after being washed.
I feel thinner wearing a skirt compared with trousers.
Whilst shopping for trousers, if I was to try on a pair and found that I needed a size larger than usual, it would make me feel fat, even though it is possible that the trousers were made too small.
Feeling fat makes me take a lot of trouble over my appearance.
Feeling fat makes me not bother about what I look like.
Feeling fat stops me from enjoying sex.
Feeling fat makes me less confident.
When I feel fat I don't want to be with anyone.

Appendix 5

The 51-item Body Shape Questionnaire

We should like to know how you have been feeling about your appearance over the past FOUR WEEKS. Please read each question and circle the appropriate number to the right. Please answer all the questions.

OVER THE PAST FOUR WEEKS

	Never	Rarely	Sometimes	Often	Very Often	Always
1) Has feeling bored made you brood about your shape?	1	2	3	4	5	6
2) Have you been so worried about your shape that you have been feeling that you ought to diet?	1	2	3	4	5	6
3) Have you thought that your thighs, hips or bottom are too large for the rest of you?	1	2	3	4	5	6
4) Have you been afraid that you might become fat (or fatter)?	1	2	3	4	5	6
5) Has feeling physically exhausted made you feel happy (or less unhappy) about your shape?	1	2	3	4	5	6
6) Have you felt that your body was horrible, unattractive or ugly?	1	2	3	4	5	6
7) Has eating even a small amount of food made you feel fat?	1	2	3	4	5	6
8) Have you worried about your flesh being not firm enough?	1	2	3	4	5	6
9) Has feeling full (eg. after eating a large meal) made you feel fat?	1	2	3	4	5	6
10) Have you felt so bad about your shape that you have cried?	1	2	3	4	5	6

	Never	Rarely	Sometimes	Often	Very Often	Always
11) Have you gone home to change your clothes because you have felt fat?	1	2	3	4	5	6
12) Have you felt that if you were happy with your shape everything in your life would be better?	1	2	3	4	5	6
13) Have you avoided running because your flesh might wobble?	1	2	3	4	5	6
14) When things have gone wrong have you felt particularly bad about your shape?	1	2	3	4	5	6
15) Has being with thin women made you feel self-conscious about your shape?	1	2	3	4	5	6
16) Have you worried about your thighs spreading out when sitting down?	1	2	3	4	5	6
17) Have you noticed the shape of other women and felt that your own shape compared unfavourably?	1	2	3	4	5	6
18) Have you worried about fitting through narrow spaces (eg. between two pieces of furniture)?	1	2	3	4	5	6
19) Have you felt ashamed of your body?	1	2	3	4	5	6
20) Have you felt that it is not fair that other women are thinner than you?	1	2	3	4	5	6
21) Has thinking about your shape interfered with your ability to concentrate (eg. while watching television, reading, listening to conversations)?	1	2	3	4	5	6
22) Has being naked, such as when taking a bath, made you feel fat?	1	2	3	4	5	6
23) Have you felt disgusted with yourself because of your shape?	1	2	3	4	5	6
24) Have you avoided wearing clothes which make you particularly aware of the shape of your body?	1	2	3	4	5	6

	Never	Rarely	Sometimes	Often	Very Often	Always
25) Has worry about your shape made you feel you ought to exercise?	1	2	3	4	5	6
26) Have you imagined cutting off fleshy areas of your body?	1	2	3	4	5	6
27) Has eating sweets, cakes, or other high calorie food made you feel fat?	1	2	3	4	5	6
28) Have you not gone out to social occasions (eg. parties) because you have felt bad about your shape?	1	2	3	4	5	6
29) Have you breathed in to make yourself look slimmer?	1	2	3	4	5	6
30) Has worry about your shape made you diet?	1	2	3	4	5	6
31) Have you felt happiest about your shape when your stomach has been empty (eg. in the morning)?	1	2	3	4	5	6
32) Have you thought that you are the shape you are because you lack self-control?	1	2	3	4	5	6
33) Have you worried about your flesh being dimply?	1	2	3	4	5	6
34) Have you vomited in order to feel thinner?	1	2	3	4	5	6
35) When in company have you worried about taking up too much room (eg. sitting on a sofa, or a bus seat)?	1	2	3	4	5	6
36) Have you thought about the amount of fat compared with the amount of muscle in your body?	1	2	3	4	5	6
37) Have you felt excessively large and rounded?	1	2	3	4	5	6
38) Have complimentary comments about your clothes or shape made you feel fat?	1	2	3	4	5	6
39) Have you pinched areas of your body to see how much fat there is?	1	2	3	4	5	6
40) Has seeing your reflection (eg. in a mirror or show window) made you feel bad about your shape?	1	2	3	4	5	6

	Never	Rarely	Sometimes	Often	Very Often	Always
41) Have you worried about other people seeing rolls of flesh around your waist or stomach?	1	2	3	4	5	6
42) Have you taken laxatives in order to feel thinner?	1	2	3	4	5	6
43) Have you measured parts of your body to see how big they are?	1	2	3	4	5	6
44) Have you avoided situations where people could see your body (eg. communal changing rooms or swimming baths)?	1	2	3	4	5	6
45) Have you been particularly self-conscious about your shape when in the company of other people?	1	2	3	4	5	6
46) Has worry about your shape made you feel miserable about your whole life?	1	2	3	4	5	6
47) Have you worn clothes designed to hide your shape from other people?	1	2	3	4	5	6
48) Has being among children made you feel that your body was too large?	1	2	3	4	5	6
49) Have you exercised in response to feeling unhappy about your shape?	1	2	3	4	5	6
50) Have you been upset about your body being pear-shaped?	1	2	3	4	5	6
51) Have you avoided fat people because they make you feel bad about your shape?	1	2	3	4	5	6

Appendix 6

Fear of fatness measure

How afraid are you of becoming fat?

- (1) Not at all
- (2) Slightly
- (3) Moderately
- (4) Markedly

Appendix 7

The importance of being slim measure

How important to you is being slim?

- (1) Not at all
- (2) Slightly
- (3) Moderately
- (4) Extremely

Appendix 8

The prevalence of bulimia nervosa: a replication study

Introduction

Since the eating disorders bulimia nervosa (Russell,1979) and bulimia (American Psychiatric Association,1980) were first described, there have been numerous epidemiological surveys designed to assess their prevalence. Many of these studies have suggested high prevalence rates. For example, among young female American women the prevalence of bulimic episodes has been estimated to be around 60 percent, and the prevalence of the syndrome DSM III bulimia has been estimated at around 19 percent (Halmi et al,1981).

Against this and similarly alarming findings, two studies produced significantly lower rates. One of these was British (Cooper and Fairburn,1983), and was conducted in 1981/82. In a questionnaire survey of women attending a family planning clinic, 20.9 percent reported binge-eating, defined as current episodes of *uncontrollable excessive eating*; 2.9 percent used self-induced vomiting to control their weight; and 1.9 percent fulfilled self-report diagnostic criteria for bulimia nervosa. Three criteria were used to define *probable bulimia nervosa*: i) binge eating; ii) self-induced vomiting for weight control; iii) a morbid fear of fatness, defined by a response of at least *Often* to the item on the Eating Attitudes Test (Garner and Garfinkel,1979) concerning *being terrified of being overweight*. The other study (Pyle et al,1983) was American, and used a questionnaire to survey a large number of college students. One percent fulfilled strict DSM III (1980) criteria for bulimia, ie. weekly binge eating episodes, plus self-induced vomiting or laxative abuse.

The authors of the American study recently replicated their earlier study (Pyle et al,1986), and using a similar questionnaire survey they reported a three-fold increase in the prevalence of bulimia nervosa ie. 3.2 percent. However, this finding is somewhat questionable since the two American studies used slightly different diagnostic criteria to define bulimia.

The aim of the present study was to investigate the prevalence of bulimia nervosa, and to compare the prevalence with that reported by Fairburn and Cooper in 1983.

Method

Over a four week period in 1986 all consecutive attenders at two Cambridge family planning clinics were asked to complete questions indicating their current age, height and weight; and to indicate how afraid they were of becoming fat, rated on a 4-point scale of *Not at all*, *Slightly*, *Moderately*, and *Extremely* (Appendix 6). They were also asked to indicate whether they currently experienced episodes of uncontrollable and excessive overeating and whether they currently used self-induced vomiting as a means of weight control. All replies were anonymous. These questions were similar to those used in the earlier British prevalence study by Cooper and Fairburn (personal communication).

Results

Three-hundred and seventy-one consecutive attenders at the clinics were asked to complete the questions. Thirteen (3.5 percent) refused. Two-hundred and seventy-six (74.4 percent) completed the questions while waiting to see the doctor, and the remainder (82) were asked to

return the questions by post. Only 55 complied. Thus, the response rate to questions completed in the clinic was much higher than those returned by post (95.5 percent versus 67.1 percent). A comparison was made of the demographic features and eating habits of the women who completed the questions in the clinic and those who returned them by post. Since there were no differences between the two groups ($P>.05$), the full sample of 331 was examined (ie. 89 percent of the original 371 women approached).

As can be seen from Table 1, these women were very similar to those in the earlier study in terms of age, weight and eating habits. In the present study a morbid fear of fatness was defined as a response of *Markedly* to the question about a fear of becoming fat. Six of the 331 women reported at least two current bulimic episodes over the past month, and used self-induced vomiting to control their weight and had a morbid fear of fatness. This represents a prevalence rate of probable bulimia nervosa of 1.8 percent, which is very similar to the rate of 1.9 percent reported in the earlier British study.

Table 1
A comparison of the 1981/82 sample with the 1986 sample

	1981/82 (N=369) %	1986 (N=331) %	χ^2	P
Age				
15-19	19.8	27.7	6.5	>.05
20-24	40.8	36.0		
25-29	22.8	20.1		
30-34	10.1	10.1		
>35	6.5	6.1		
MPMW				
<75	0.0	0.3	7.6	>.05
75-85	7.4	11.4		
86-100	52.3	55.7		
101-115	33.7	26.8		
>115	6.6	5.8		
Eating behaviour				
Bulimic episodes	20.9	27.1	3.50	>.05
Self-induced vomiting	2.9	2.4	0.09	>.05
Probable bulimia nervosa	1.9	1.8	0.04	>.05

Discussion

This study replicates an earlier British survey concerning the prevalence of bulimia nervosa. Both studies used similar measures on samples very similar in demographic features. Similar prevalence rates were found for bulimic episodes, self-induced vomiting and probable bulimia nervosa.

It could be argued that a comparison of syndrome prevalence is illegitimate since the later study defined *a morbid fear of fatness* in a different way to the first. Since in both the present study and the first (personal communication) no individual reported disturbed eating in the absence of a morbid fear of fatness; and in both studies many more women reported a fear of fatness than bulimic episodes and self-induced vomiting, it is unlikely that the different definitions had influence on the syndrome prevalence figures.

It is unclear why there was a difference in prevalence rates between the two American studies but not between the two British studies. One reason may be a genuine difference in the prevalence of disturbed eating behaviour between the two countries. Another reason may be that different diagnostic criteria and assessment measures were used in the American and British studies. Thus, the epidemiology of bulimia nervosa will remain uncertain until common diagnostic criteria and research methods are used.

Appendix 9

Items eliminated from the BSQ by the correlational method

- (1)
 - (i) *Retained:* Have you felt ashamed of your body?
 - (ii) *Dropped:* Have you felt that your body was horrible, unattractive or ugly?
- (2)
 - (i) *Retained:* Have you felt that if you were happy with your shape everything in your life would be better?
 - (ii) *Dropped:* When things have gone wrong have you felt particularly bad about your shape?
- (3)
 - (i) *Retained:* Have you felt disgusted with yourself because of your shape?
 - (ii) *Dropped:* Have you felt that if you were happy with your shape everything in your life would be better?
- (4)
 - (i) *Retained:* Has being naked, such as when taking a bath, made you feel fat?
 - (ii) *Dropped:* Have you felt disgusted with yourself because of your shape?
- (5)
 - (i) *Retained:* Have you avoided wearing clothes which make you particularly aware of the shape of your body?
 - (ii) *Dropped:* Have you worn clothes designed to hide your shape from other people?
- (6)
 - (i) *Retained:* Have you been particularly self-conscious about your shape when in the company of other people?
 - (ii) *Dropped:* Has worrying about your shape made you feel miserable about your whole life?

Appendix 10

Items eliminated from the BSQ by the discrimination method

- (1) Has feeling physically exhausted made you feel happy (or less unhappy) about your shape?
- (2) Have you breathed in to make yourself look slimmer?
- (3) Have you thought about the amount of fat compared with the amount of muscle in your body?
- (4) Have you measured parts of your body to see how big they are?
- (5) Have you exercised in response to feeling unhappy about your shape?
- (6) Have you been upset about your body being pear-shaped?

Appendix 11

Items eliminated from the BSQ by the endorsement method

- (1) Have you gone home to change your clothes because you have felt fat?
- (2) Have you worried about fitting through narrow spaces (eg. between two pieces of furniture)?
- (3) Have complimentary comments about your clothes or appearance made you feel fat?
- (4) Has being among children made you feel that your body was too large?
- (5) Have you avoided fat people because they make you feel bad about your shape?

Appendix 12

The 34-item Body Shape Questionnaire

We should like to know how you have been feeling about your appearance over the past FOUR WEEKS. Please read each question and circle the appropriate number to the right. Please answer all the questions.

OVER THE PAST FOUR WEEKS

	Never	Rarely	Sometimes	Often	Very Often	Always
1) Has feeling bored made you brood about your shape?	1	2	3	4	5	6
2) Have you been so worried about your shape that you have been feeling that you ought to diet?	1	2	3	4	5	6
3) Have you thought that your thighs, hips or bottom are too large for the rest of you?	1	2	3	4	5	6
4) Have you been afraid that you might become fat (or fatter)?	1	2	3	4	5	6
5) Have you worried about your flesh being not firm enough?	1	2	3	4	5	6
6) Has feeling full (eg. after eating a large meal) made you feel fat?	1	2	3	4	5	6
7) Have you felt so bad about your shape that you have cried?	1	2	3	4	5	6
8) Have you avoided running because your flesh might wobble?	1	2	3	4	5	6
9) Has being with thin women made you feel self-conscious about your shape?	1	2	3	4	5	6
10) Have you worried about your thighs spreading out when sitting down?	1	2	3	4	5	6
11) Has eating even a small amount of food made you feel fat?	1	2	3	4	5	6
12) Have you noticed the shape of other women and felt that your own shape compared unfavourably?	1	2	3	4	5	6

	Never	Rarely	Sometimes	Often	Very Often	Always
13) Has thinking about your shape interfered with you ability to concentrate (eg. while watching television, reading, listening to conversations)?	1	2	3	4	5	6
14) Has being naked, such as when taking a bath, made you feel fat?	1	2	3	4	5	6
15) Have you avoided wearing clothes which make you particularly aware of the shape of your body?	1	2	3	4	5	6
16) Have you imagined cutting off fleshy areas of your body?	1	2	3	4	5	6
17) Has eating sweets, cakes, or other high calorie food made you feel fat?	1	2	3	4	5	6
18) Have you not gone out to social occasions (eg. parties) because you have felt bad about your shape?	1	2	3	4	5	6
19) Have you felt excessively large and rounded?	1	2	3	4	5	6
20) Have you felt ashamed of your body?	1	2	3	4	5	6
21) Has worry about your shape made you diet?	1	2	3	4	5	6
22) Have you felt happiest about your shape when your stomach has been empty (eg. in the morning)?	1	2	3	4	5	6
23) Have you thought that you are the shape you are because you lack self-control?	1	2	3	4	5	6
24) Have you worried about other people seeing rolls of flesh around your waist or stomach?	1	2	3	4	5	6
25) Have you felt that it is not fair that other women are thinner than you?	1	2	3	4	5	6
26) Have you vomited in order to feel thinner?	1	2	3	4	5	6
27) When in company have you worried about taking up too much room (eg. sitting on a sofa, or a bus seat)?	1	2	3	4	5	6

	Never	Rarely	Sometimes	Often	Very Often	Always
28) Have you worried about your flesh being dimply?	1	2	3	4	5	6
29) Has seeing your reflection (eg. in a mirror or show window) made you feel bad about your shape?	1	2	3	4	5	6
30) Have you pinched areas of your body to see how much fat there is?	1	2	3	4	5	6
31) Have you avoided situations where people could see your body (eg. communal changing rooms or swimming baths)?	1	2	3	4	5	6
32) Have you taken laxatives in order to feel thinner?	1	2	3	4	5	6
33) Have you been particularly self-conscious about your shape when in the company of other people?	1	2	3	4	5	6
34) Has worry about your shape made you feel you ought to exercise?	1	2	3	4	5	6

Appendix 13

Questions used to gain information from women in the community

How old are you?
How tall are you?
What do you weigh? (If uncertain, give your best estimate)
What would you like to weigh?
Are you currently on a diet? If so, why and what is the diet?
Do you regard yourself as having an eating problem? If so, please describe the problem.
Have you had an eating problem in the past? If so, please describe the problem.
Do you regard yourself as having a weight problem? If so, what is the problem.
Have you had a weight problem in the past? If so, what was the problem?
Did it interfere with your periods, and if so, for how long?
What has been your lowest weight since puberty?
How old were you at the time?
What was your height?
What has been your highest weight since puberty?
How old were you at the time?
What was your height?
Do you currently have episodes of uncontrolled and excessive eating? If so, how many times has this happened over the past four weeks?
Do you currently make yourself sick as a means of controlling your weight? If so, how many times have you done this over the past four weeks?
Do you currently take laxatives as a means of controlling your weight? If so, how many times have you done this over the past four weeks?

Appendix 14

Questions used to gain information from the Weight Watchers

What weight would you like to be? Would you really be satisfied with that weight?

What has been your highest weight since puberty? How old were you then? And how tall were you then?

What is your *Weight Watchers* goal weight?

What was your weight when you joined *Weight Watchers*?

Were you at any time during childhood put on a diet in order to reduce your weight?

Were you aware of having *puppy fat* at puberty?

Did it bother you?

How did you feel about the changes in your shape at puberty, for example, your hips, breasts?

Appendix 15

Questions used to gain information from men

How old are you?

How tall are you?

What do you weigh? (If uncertain, please give your best estimate).

What would you like to weigh?

Are you currently on a diet? If so, why and what is the diet?

Have you ever dieted to lose weight? If yes, please give brief details.

What has been your highest weight since puberty?

How old were you then?

What was your height

What has been your lowest weight since puberty?

How old were you then?

What was your height?

Over the past six months have you had episodes of uncontrollable and excessive overeating?

If so, how many times has this happened over the past month?

Have you ever experienced episodes of uncontrollable and excessive overeating? If yes, please give a brief description.

Over the past six months have you made yourself sick to control your weight?

If yes, how many times has this happened over the past month?

Have you ever made yourself sick to control your weight? If yes, please give a brief description.

Over the past six months have you taken laxatives to control your weight?

If yes, how many times have you done this over the past month?

Have you ever taken laxatives to control your weight? If yes, please give a brief description.

Appendix 16

Recruitment of subjects for the study of the menstrual cycle

I'm doing a research project in clinical psychology, and am studying the physical and mental health of Cambridge students over this term. Would you be willing to help? Firstly, I'd like to emphasise that all information is strictly confidential. The first thing I'd like to know is are you taking any medication? So you're not taking the contraceptive pill?

The study will involve filling in a few simple questionnaires every day (which will take about 30 seconds), and I will come around once a week to see how you're getting on, and to ask a few extra questions.

O.K.? Thanks very much. May I ask you a few introductory questions now?

Name

Date of birth

Year at University

Academic subject

How are you coping with your work? Do you feel that you are under any stress?

Height

Weight

Have you ever had a serious physical illness?

Have you had any illnesses recently eg. colds, 'flu, etc.?

Do you have menstrual periods? Are they regular?

When was your last period?

And when is your next period due?

Are you on a special diet, eg. vegetarian?

Do you give blood? When last?

Appendix 17

Visual analogue scales

Please indicate by marking each line in the appropriate place how you have been feeling TODAY.

1. Tiredness

Not at all tired Extremely tired

2. Aches and pains

No aches and pains Severe aches and pains

3. Irritable

Not at all irritable Extremely irritable

4. Mood

Very happy Extremely unhappy

5. Bloating

Not at all bloated Extremely bloated

6. Tension

Not at all tense Extremely tense

Appendix 18

Questions asked each week by the interviewer

Have you had a cold/'flu over the past week?

Have you been under more stress than usual?

Have you started a period?

Have you had an upset stomach?

Have you had more exercise than usual?

Appendix 19

Instructions used to measure body size perception: Chapter 4, Section 1

"Hello. I'm Melanie Taylor and I'm a doctoral student. I'm investigating perception of body size. The research is completely confidential. A number will be assigned to each subject, so that names do not appear next to information about individuals. There are two main parts to the experiment. The first involves various measures relating to your body size; and the second involves completing various questions about yourself. The first part of the experiment necessitates taking a photograph of you. It is important that subjects are able to view the outline of their body and for this reason all subjects wear a dark coloured leotard which I provide. Some people don't like this bit much, but it only takes a few seconds, and then the experiment gets interesting. Therefore, would you object to having your photograph taken wearing a leotard?

(subject is photographed wearing leotard and then dresses)

O.K. Thank you very much. You're now going to see a picture of yourself on the screen in front of you, and this knob here controls the width of the picture, if you would like to take it and play around with it for a minute. Moving the knob clockwise makes the image wider and moving the knob anticlockwise makes the image narrower. I'm going to ask you to correct the picture you see and it is important that you are as accurate as possible, so make as many adjustments and readjustments as you like before settling on the final picture. I don't mind how many times you move the picture in and out, or how long it takes you.

Perceived size

You're looking at a distorted image of yourself and I would like you to correct the distorted image. I will ask you to do this twice - once from wide and once from narrow. Adjust the image so that it corresponds to your actual size. Do you understand or shall I go through it again?

"Adjust the image so that it corresponds to your actual size"

O.K. Now I'd like you to move the image all the way in/out.

And now I'd like you to do it again, this time turning the knob in the other direction.

"Adjust the image so that it corresponds to your actual size"

Desired size

I'd now like you to adjust the image of yourself to the size that you would most like to be. I'll ask you to do this twice - once from wide and once from narrow. Do you understand or shall I go through it again?

"Adjust the image to the size you would most like to be"

O.K. Now I'd like you to move the image all the way in/out.

And now I'd like you to do it again.

"Adjust the image to the size you would most like to be"

O.K. Thanks very much."

Appendix 20

Reliability of body size perception : fifty normal women

The reliability of the image distortion method used to measure body size perception reported in Section 1 of Chapter 4 was established as follows, based on the data from the sample of 50 normal young women.

Test re-test reliability

For perceived size estimations made from the widely distorted image and the narrowly distorted image were significantly related ($r=.81$, $P<.001$); and similarly for desired size ($r=.84$, $P<.001$). The first fifteen subjects were retested between three and five weeks later. For both perceived size and desired size estimations made from narrowly and widely distorted images and the means of these two estimations were significantly related across the two testing occasions, as shown in Table 1.

Table 1
Correlations (Pearson's r) between the 1st and 2nd testing occasions

	Perceived size		Desired size	
	r	P	r	P
From narrow ¹	.54	.02	.71	.01
From wide ²	.64	.01	.79	.001
Mean narrow/wide ³	.57	.01	.80	.001

1 Image initially placed on its narrowest width

2 Image initially placed on its widest width

3 Mean of estimations made from narrowly and widely distorted images

Directional differences

Directional differences are a common psychophysical phenomenon, and were discussed in Chapter 1. When adjusting a stimulus presented from its maximum level a subject usually does not reduce it sufficiently; and when adjusting a stimulus presented from its minimum level a subject usually does not enlarge it sufficiently. Psychophysics experiments generally present the mean of both estimations. Indeed, the author was unable to find a published psychophysical experiment which reported the difference between estimations made from maximum and minimum

stimuli.¹ Differences between estimations made from widely and narrowly distorted images were minimized by instructing subjects that they might adjust the image in and out as many times as necessary before settling on their final estimation. Table 2 shows that estimations made from wide and narrow images were significantly different.

Table 2
Differences in estimations made from widely and narrowly distorted images

	Image adjusted from narrow \bar{X}/sd	Image adjusted from wide \bar{X}/sd	t	df	P
Perceived size	95.8 10.3	103.1 11.2	7.78	49	.001
Desired size	81.2 10.7	88.3 11.3	8.13	49	.001

Despite these differences, there was no reason to believe that they were problematic for interpreting estimations since it is relative rather than absolute estimations which are important in studies of body size perception.

Thus, the image distortion method used to measure body size perception reported in Section 1 of Chapter 4 was deemed to show a satisfactory degree of test re-test reliability for women in the community.

¹ The difference between estimations made from maximum and minimum stimuli is often reduced by a procedure known as 'bracketing'. The subject makes an estimation from the maximum stimulus and is then asked to reduce the stimulus further and then re-adjust their estimation. Similarly, the subject estimates from a narrow stimulus and is asked to enlarge the stimulus further and then re-adjust it. The current author tested bracketing in a pilot study of body size perception but discarded the procedure because it confused subjects. Furthermore, asking subjects to re-adjust their estimation was interpreted as the initial estimation being incorrect.

Appendix 21

The semi-structured interview

I now have to ask all subjects some rather personal questions. As I stressed before, your responses are completely confidential.

- (1) What has been your lowest weight since being an adult?
How old were you then?
How tall were you then?
- (2) What has been your highest weight since being an adult?
How old were you then?
How tall were you then?
- (3) In the past have you ever had an eating or weight problem?
When was this?
How long did it last?
Did you receive any help with this problem?
- (4) Do you have an eating or weight problem now?
Are you receiving any help?
- (5) Are you currently on a diet to control your weight?
- (6) Finally, what would you like to weigh?

Appendix 22

Instructions used to measure body size perception: Chapter 4, Section 2

I'm going to ask you to estimate your body size. I have some rather elaborate equipment here for measuring estimations of body size. You're going to see an image of yourself on the television screen and you'll be able to vary the width of the image. It's necessary that you are able to see the outline of your body and for this reason I ask everyone to wear a dark coloured leotard which I provide. Some people don't like this bit much, but you are the only one who really looks at yourself and you will probably find the procedure interesting. Would you mind putting on a leotard?

This knob here controls the width of the image on the television screen. Moving the knob one way makes the image grow slowly wider; and moving the knob the other way makes the image grow slowly narrower. I'm going to ask you to correct a false image until it corresponds with your true size. It is important that you are as accurate as possible and so please move the image in and out as many times as you like before settling on the final width. It doesn't matter how long you take. Do you understand?

Now, I should like you to stand up nice and straight with your heels on the white tape, with your arms held away from the side of you. O.K.?

Before we begin I'd like you to move the image all the way in/out.

I'd like you to adjust the image so that it corresponds with your actual size. Please remember to tell me when you have finished and please be as accurate as possible. Do you understand?

"Adjust the image so that it corresponds to your actual size. Please be as accurate as possible and please tell me when you have finished"

That's fine. Now I'd like you to move the image all the way out/in.

O.K. And again I'd like you to

"Adjust the image so that it corresponds to your actual size"

(Repeat).

That's fine. Now I'd like you to adjust the image to the size you would most like to be. Do you understand what I mean by this?

"Adjust the image to the size you would most like to be"

That's fine. Now I'd like you to move the image all the way in/out.

"And again I'd like you to adjust the image to the size you would most like to be."

Appendix 23

Reliability of body size perception: women in the community

Test re-test reliability

The test re-test reliability of the image distortion method used to measure body size perception reported in Sections 2 and 3 of Chapter 4 was established as follows.

A group of 24 women were selected on their availability and provided data for a reliability study of body size perception. The mean age of these subjects was 42.3 years, $sd=13.1$, and their mean weight was 93.9 percent, $sd=11.0$. They were asked to estimate their body size and indicate their desired size using the method reported in Section 2 of Chapter 4. For both perceived and desired size there were two estimations made from a widely distorted image made in close succession; and two from a narrowly distorted image. The two estimations made from the same direction of distortion were significantly related, as shown in Table 1.

Table 1
The reliability of two successive trials of body size estimation

	Perceived size r	Desired size P	r	P
Image adjusted From narrow	.86	.001	.90	.001
Image adjusted From wide	.91	.001	.92	.001

Despite this satisfactory degree of test re-test reliability, subjects showed a considerable range in estimations across trials. Table 2 shows the mean differences between estimations made from the same direction of distortion.

Table 2
Differences between successive estimations

	Perceived size \bar{x}/sd	Desired size \bar{x}/sd
Narrow-narrow mean difference	4.62 10.80	1.93 9.82
Wide-wide mean difference	1.04 7.83	0.15 8.91

The 24 women repeated the assessment of body size perception between six and ten weeks later. Estimations made on the first testing occasion were significantly related to estimations made on the second occasion, as shown in Table 3. These relationships were slightly stronger than the test re-test correlations reported in Appendix 20 for the method described in Section 1 of Chapter 4.

Table 3
Relationships between estimations made between 6 and 10 weeks apart

	Perceived size		Desired size	
	r	P	r	P
From narrow 1st trial	.51	.01	.65	.001
From narrow 2nd trial	.68	.001	.79	.001
From wide 1st trial	.53	.01	.60	.001
From wide 2nd trial	.45	.02	.64	.001

Thus, this method of measuring body size perception was deemed to show a satisfactory degree of test re-test reliability for women in the community.

Directional differences

Similar to the method of measuring body size perception reported in Appendix 20, estimations made from widely and narrowly distorted images were significantly different, as shown in Table 3.

Table 3
Differences between estimations made from widely and narrowly distorted image

	Narrow image ¹ \bar{X}/sd	Wide image ¹ \bar{X}/sd	t	df	P
Perceived size	108.5 16.8	123.5 18.4	5.80	23	.001
Desired size	94.3 19.0	103.9 22.1	4.74	23	.001

1 Mean of 2 trials

Despite these differences, there was no reason to believe that they were problematic for interpreting estimations since it is relative rather than absolute estimations which are important in studies of body size perception.

Validity

Assessing the validity of a measure is difficult and can be approached in a number of ways. Although perception of body size and concern with body shape are not necessarily invariably related, one would expect a relationship between these two aspects of body image, and establishing a significant relationship would provide one assessment of the validity of body size perception.

For the group of women in the community reported in Section 2 of Chapter 4, perceived size, desired size and body size dissatisfaction (ie. perceived size minus desired size) were significantly related to score on the BSQ (see Chapter 2) (for perceived size Spearman's $r=.43$, $P<.01$; for desired size Spearman's $r=-.49$, $P<.01$; and for body size dissatisfaction Spearman's $r=.69$, $P<.001$).

Thus, this method of measuring body size perception was deemed to show a satisfactory degree of concurrent validity for women in the community.

Discussion

Despite showing a satisfactory degree of test re-test reliability and concurrent validity, the image distortion method used to measure body size perception reported in Sections 2 and 3 of Chapter 4 and Section 2 of Section 5 had several limitations. Subjects viewed their image from quite a distance (4.5m), and it was not possible to reduce this distance due to the shape of the

¹ Spearman's r was used in preference to Pearson's r because BSQ scores were not normally distributed.

experimental room. This distance may have made estimations more variable for reasons discussed in Section 3 of Chapter 1 (see P.20).

It is possible that the variability in estimations may have been reduced by using a life-size image for reasons discussed in Section 3 of Chapter 1 (see P.20), but this was not possible with the resources available. The variability of estimations was minimized by allowing subjects to control the image width themselves, and by using a slow-adjusting control button to allow fine adjustment of estimations. Nevertheless, there was still a considerable range in estimations.

A further limitation of this method of measuring body size perception was that the equipment allowed greater levels of wide distortion compared with narrow distortion (ie. 50-220%). This factor is likely to have biased estimations in favour of overestimation for reasons discussed in Section 3 of Chapter 1 (see P.20). Indeed, the mean estimation for the women in the community described in Section 3 of Chapter 4 was 105.8 percent. It would have been desirable to use equal levels of wide and narrow distortion, but this was an electronic problem which was not solved. However, unequal levels of distortion was not considered a problem for interpreting estimations since it is relative rather than absolute estimations which are important.

One strong point about the method used to measure body size perception was that standardised experimental instructions were used throughout, which was important for reasons outlined in Section 3 of Chapter 1 (see P.18). Despite the limitations of the reported image distortion method, it showed a satisfactory degree of test re-test reliability and concurrent validity, and was considered to adequately measure perception of body size.

Appendix 24

Mood induction cards

Statements used for the induction of low mood

I feel ashamed of things I've done
I am less successful than other people
I feel drained of energy and thoroughly worn out
I don't think I could exert myself even if I wanted to
Everything I do seems to turn out badly
I'm so tired I don't want to do anything at all
I feel disappointed with the way things have turned out
I don't get the same satisfaction out of things as I used to
There are things about me that I don't like
I feel so tired I just want to sit and do nothing
The future seems just one string of problems
I feel lonely and isolated
I'm not hopeful about the future
I've made many mistakes in my life
There are things about me that aren't very attractive
Life seems boring and uninteresting
It seems such an effort to do anything
I'm miserable and things aren't going to get any better
I wish I was somebody else
I really can't be bothered to do anything
I think I make a bad impression on other people
I get annoyed at myself for being bad at making decisions
I just can't make the effort to liven myself up
Many people don't have a very high opinion of me
There are too many bad things in my life

Statements used for the control condition

I feel that I am a nice person
I enjoy being with my friends
Doing something I am good at is very satisfying
I have a positive outlook on life
I love hearing waves crash on to a pebbly beach
I like to look at and smell fresh flowers
I enjoy going out with my friends
There are things that I look forward to in the future
I like watching the seasons change
I am equally able or more able than the average person
I feel that my friends bring out my good points

Making other people laugh makes me feel good
I enjoy having no work to do
I feel relaxed when I am with my closest friends
I love to see a rainbow
I think sunset is a beautiful time of the day
I like to curl up with a good book
I enjoy having a lie in
I can trust my friends
I have been successful at some things
I like sitting in the shade on a hot summer day
Receiving letters gives me great pleasure
I'd like to give everyone a present
Listening to my favourite music gives me great pleasure
I like watching the leaves change colour in Autumn

Appendix 25

Mood visual analogue scale

Please mark the line between A and B as appropriate: the exact place you mark will depend on how despondent you feel.

A. I am feeling
not at all
despondent

B. I am feeling
extremely
despondent



Appendix 26

Mood induction open-ended statements

Open-ended statements completed by subjects in the low mood condition

I feel ashamed of myself because....

I feel a failure because....

I feel disappointed with myself because....

I feel I let myself down by....

I feel I let other people down by....

Open-ended statements completed by subjects in the control condition

I feel proud of myself because....

I feel a success because....

I feel happy with myself because....

I feel I do myself justice by....

I feel I help other people by....

Appendix 27

Intercorrelations between measures for patients with bulimia nervosa (N=72)

	BSQ	Age	MPMW	High MPMW	Low MPMW	Des. MPMW
Age	.09 >.05					
MPMW	.21 .04	.05 >.05				
High MPMW	.25 .02	.21 .04	.67 .001			
Low MPMW	.25 .02	.08 >.05	.60 .001	.35 .002		
Desired MPMW	.11 >.05	.17 >.05	.72 .001	.39 .001	.51 .001	
Weight Dissat.	.28 .02	.05 >.05	.93 .001	.72 .001	.54 .001	.42 .001
Dur. Binge.	.12 >.05	.43 .001	.03 >.05	.08 >.05	.13 >.05	.17 >.05
Freq. Binge.	-.09 >.05	.08 >.05	.09 >.05	.02 >.05	.05 >.05	.15 >.05
Freq. Vomit.	-.15 >.05	.03 >.05	.10 >.05	.02 >.05	.14 >.05	.02 >.05
Freq. Lax.	.30 .01	.09 >.05	.02 >.05	.07 >.05	.14 >.05	.04 >.05
Freq. Exerc.	.03 >.05	.32 .003	.05 >.05	.12 >.05	.02 >.05	.01 >.05
EAT	.50 .001	.12 >.05	.09 >.05	.02 >.05	.09 >.05	.03 >.05
DT	.72 .001	.18 .08	.11 >.05	.14 >.05	.05 >.05	.04 >.05

B	.14 >.05	.14 >.05	.04 >.05	.10 >.05	.06 >.05	.02 >.05
BD	.74 .001	.07 >.05	.45 .001	.43 .001	.49 .001	.33 .01
I	.42 .001	.10 >.05	.19 .07	.05 >.05	.23 .04	.36 .01
P	.35 .002	.12 >.05	.09 >.05	.09 >.05	.09 >.05	.04 >.05
ID	.44 .001	.02 >.05	.11 >.05	.05 >.05	.14 >.05	.25 .04
IA	.32 .004	.25 .02	.10 >.05	.12 >.05	.05 >.05	.14 >.05
MF	.21 .05	.20 .06	.07 >.05	.06 >.05	.02 >.05	.15 >.05
Diet. Restr.	.36 .02	.03 >.05	.10 >.05	.07 >.05	.15 >.05	.01 >.05
Disinh.	.14 >.05	.01 >.05	.14 >.05	.30 .04	.13 >.05	.03 >.05
Perc. Hung.	.08 >.05	.19 >.05	.24 .08	.23 >.05	.10 >.05	.01 >.05
BDI	.44 .001	.07 >.05	.03 >.05	.09 >.05	.04 >.05	.21 .06
Self- Esteem	.52 .001	.03 >.05	.09 >.05	.13 >.05	.08 >.05	.21 .07
Social Adjust.	.45 .001	.04 >.05	.07 >.05	.06 >.05	.03 >.05	.22 .05
S	.30 .01	.22 .04	.04 >.05	.02 >.05	.01 >.05	.03 >.05
OC	.37 .001	.01 >.05	.19 .07	.11 >.05	.13 >.05	.34 .01

IS	.59 .001	.11 >.05	.12 >.05	.16 >.05	.04 >.05	.04 >.05
D	.43 .001	.01 >.05	.04 >.05	.03 >.05	.03 >.05	.27 .02
A	.26 .02	.08 >.05	.04 >.05	.01 >.05	.15 >.05	.27 .03
H	.24 .03	.06 >.05	.24 .03	.02 >.05	.06 >.05	.31 .01
PA	.19 .06	.07 >.05	.11 >.05	.10 >.05	.02 >.05	.15 >.05
PI	.48 .001	.13 >.05	.01 >.05	.13 >.05	.01 >.05	.23 .05
P	.47 .001	.20 .06	.01 >.05	.04 >.05	.03 >.05	.15 >.05
GSI	.49 .001	.10 >.05	.03 >.05	.05 >.05	.04 >.05	.24 .04
	Weight Dissat	Dur. Binge.	Freq. Binge.	Freq. Vomit.	Freq. Lax.	Freq. Exerc.
Dur. Binge.	.18 >.05					
Freq. Binge.	.01 >.05	.08 >.05				
Freq. Vomit.	.01 >.05	.16 >.05	.84 .001			
Freq. Lax.	.01 >.05	.08 >.05	.01 >.05	.14 >.05		
Freq. Exerc.	.09 >.05	.10 >.05	.16 >.05	.09 >.05	.06 >.05	
EAT	.06 >.05	.23 .03	.01 >.05	.08 >.05	.22 .03	.09 >.05

DT	.08 >.05	.16 >.05	.19 .07	.29 .01	.21 .05	.03 >.05
B	.05 >.05	.19 .06	.06 >.05	.01 >.05	.11 >.05	.17 >.05
BD	.48 .001	.14 >.05	.03 >.05	.04 >.05	.17 >.05	.07 >.05
I	.04 >.05	.04 >.05	.05 >.05	.06 >.05	.12 >.05	.09 >.05
P	.14 >.05	.07 >.05	.28 .02	.23 .04	.14 >.05	.10 >.05
ID	.07 >.05	.09 >.05	.01 >.05	.02 >.05	.19 .06	.20 .05
IA	.08 >.05	.03 >.05	.02 >.05	.05 >.05	.12 >.05	.10 >.05
MF	.03 >.05	.02 >.05	.04 >.05	.08 >.05	.24 .03	.05 >.05
Diet. Rest.	.21 >.05	.11 >.05	.14 >.05	.29 .05	.17 >.05	.17 >.05
Disinhib.	.12 >.05	.21 >.05	.40 .01	.58 .001	.12 >.05	.13 >.05
Perc. Hung.	.21 >.05	.12 >.05	.14 >.05	.21 >.05	.17 >.05	.14 >.05
BDI	.17 >.05	.19 >.05	.07 >.05	.01 >.05	.14 >.05	.06 >.05
Self- Esteem	.20 .07	.04 >.05	.18 >.05	.06 >.05	.01 >.05	.01 >.05
Social Adjust.	.09 >.05	.10 >.05	.01 >.05	.07 >.05	.13 >.05	.01 >.05
S	.01 >.05	.04 >.05	.22 .04	.29 .01	.24 .03	.02 >.05
OC	.09	.02	.08	.08	.07	.18

	>.05	>.05	>.05	>.05	>.05	.07
IS	.11 >.05	.02 >.05	.01 >.05	.01 >.05	.19 .06	.07 >.05
D	.11 >.05	.04 >.05	.05 >.05	.04 >.05	.08 >.05	.01 >.05
A	.14 >.05	.09 >.05	.07 >.05	.13 >.05	.03 >.05	.01 >.05
H	.09 >.05	.12 >.05	.03 >.05	.03 >.05	.05 >.05	.11 >.05
PA	.14 >.05	.03 >.05	.36 .001	.47 .001	.03 >.05	.14 >.05
PI	.09 >.05	.12 >.05	.06 >.05	.03 >.05	.15 >.05	.03 >.05
P	.10 >.05	.13 >.05	.02 >.05	.02 >.05	.17 >.05	.02 >.05
GSI	.04 >.05	.05 >.05	.09 >.05	.13 >.05	.14 >.05	.01 >.05
	EAT	DT	B	BD	I	P
DT	.69 .001					
B	.32 .01	.25 .03				
BD	.31 .01	.47 .001	.15 >.05			
I	.50 .001	.36 .002	.32 .01	.21 .05		
P	.17 .08	.34 .01	.11 >.05	.15 >.05	.27 .02	
ID	.43 .001	.33 .01	.21 .05	.22 .04	.59 .001	.36 .01

IA	.45 .001	.44 .001	.31 .01	.10 >.05	.55 .001	.19 .06
MF	.10 >.05	.16 >.05	.14 >.05	.03 >.05	.38 .001	.02 >.05
Diet. Restr.	.48 .002	.49 .002	.28 .06	.19 >.05	.16 >.05	.31 .04
Disinh.	.03 >.05	.29 .05	.30 .05	.03 >.05	.08 >.05	.07 >.05
Perc. Hung.	.11 >.05	.09 >.05	.41 .01	.07 >.05	.14 >.05	.26 .07
BDI	.40 .001	.35 .002	.36 .001	.21 .05	.62 .001	.15 >.05
Self- Esteem	.37 .001	.29 .01	.13 >.05	.27 .02	.69 .001	.20 .06
Social Adjust.	.32 .01	.34 .01	.15 >.05	.15 >.05	.57 .001	.37 .001
S	.33 .01	.16 >.05	.35 .01	.16 >.05	.46 .001	.03 >.05
OC	.24 .03	.30 .008	.13 >.05	.01 >.05	.53 .001	.21 .05
IS	.34 .002	.38 .001	.01 >.05	.29 .01	.54 .001	.32 .01
D	.38 .001	.32 .01	.14 >.05	.16 >.05	.54 .001	.24 .03
A	.21 .06	.14 .02	.15 >.05	.01 >.05	.46 .001	.08 >.05
H	.20 .06	.28 .02	.13 >.05	.02 >.05	.41 .001	.04 >.05
PA	.12 >.05	.03 >.05	.16 >.05	.07 >.05	.26 .02	.03 >.05

PI	.27 .02	.33 .01	.07 >.05	.16 >.05	.53 .001	.17 >.05
P	.33 .01	.39 .001	.13 >.05	.10 >.05	.48 .001	.28 .02
GSI	.35 .01	.33 .01	.18 >.05	.13 >.05	.61 .001	.18 >.05
	ID	IA	MF	Diet. Restr.	Disinh.	Perc. Hung.
IA	.50 .001					
MF	.12 >.05	.24 .03				
Diet. Restr.	.11 >.05	.02 >.05	.13 >.05			
Disinh.	.01 >.05	.07 >.05	.02 >.05	.13 >.05		
Perc. Hung.	.25 .08	.02 >.05	.17 >.05	.16 >.05	.50 .001	
BDI	.48 .001	.60 .001	.31 .01	.06 >.05	.05 >.05	.01 >.05
Self- Esteem	.49 .001	.35 .002	.29 .01	.16 >.05	.01 >.05	.22 >.05
Social Adjust.	.59 .001	.49 .001	.25 .02	.07 >.05	.03 >.05	.20 >.05
S	.42 .001	.58 .001	.18 .08	.30 .04	.37 .02	.14 >.05
OC	.63 .001	.58 .001	.14 >.05	.04 >.05	.07 >.05	.23 >.05
IS	.54 .001	.45 .001	.18 .08	.12 >.05	.06 >.05	.30 .05
D	.49	.53	.27	.02	.11	.27

	.001	.001	.02	>.05	>.05	.06
A	.36 .002	.56 .001	.23 .04	.05 >.05	.21 >.05	.33 .03
H	.17 >.05	.37 .001	.17 >.05	.02 >.05	.16 >.05	.37 .02
PA	.27 .02	.32 .01	.17 .09	.21 >.05	.32 .03	.37 .02
PI	.52 .001	.50 .001	.29 .01	.01 >.05	.01 >.05	.18 >.05
P	.58 .001	.61 .001	.21 .05	.06 >.05	.03 >.05	.28 .06
GSI	.57 .001	.65 .001	.26 .02	.04 >.05	.12 >.05	.24 >.05
	BDI	Self- Esteem	Social Adjust.	S	OC	IS
Self- Esteem	.61 .001					
Social Adjust.	.64 .001	.50 .001				
S	.42 .001	.34 .003	.46 .001			
OC	.59 .001	.59 .001	.65 .001	.54 .001		
IS	.57 .001	.71 .001	.61 .001	.42 .001	.66 .001	
D	.79 .001	.74 .001	.68 .001	.45 .001	.72 .001	.74 .001
A	.52 .001	.49 .001	.53 .001	.59 .001	.69 .001	.53 .001

AH	.58 .001	.41 .001	.44 .001	.33 .003	.47 .001	.46 .001
PA	.28 .01	.47 .001	.33 .003	.56 .001	.55 .001	.39 .001
PI	.56 .001	.54 .001	.63 .001	.49 .001	.66 .001	.71 .001
P	.67 .001	.62 .001	.62 .001	.46 .001	.72 .001	.72 .001
GSI	.73 .001	.71 .001	.72 .001	.69 .001	.87 .001	.82 .001
	D	A	AH	PA	PI	P
A	.62 .001					
AH	.52 .001	.38 .001				
PA	.48 .001	.64 .001	.19 .07			
PI	.59 .001	.55 .001	.47 .001	.38 .001		
P	.72 .001	.59 .001	.41 .001	.47 .001	.75 .001	
GSI	.85 .001	.80 .001	.62 .001	.65 .001	.81 .001	.84 .001

Abbreviations

MPMW - Mean population matched weight
Weight Dissat. - Weight dissatisfaction
Dur. Binge. - Duration of bingeing
Freq. Binge. - Frequency of bingeing over the past month
Freq. Vomit. - Frequency of vomiting over the past month
Freq. Lax. - Frequency of abusing laxatives over the past month
Freq. Exerc. - Frequency of exercise for weight and shape over the past month
DT - EDI *Drive for Thinness* subscale
B - EDI *Bulimia* subscale
BD - EDI *Body Dissatisfaction* subscale
I - EDI *Ineffectiveness* subscale
P - EDI *Perfectionism* subscale
ID - EDI *Interpersonal Distrust* subscale
IA - EDI *Interoceptive Awareness* subscale
MF - EDI *Maturity Fears* subscale
Diet. Rest. - *Dietary Restraint* subscale of the Three Factor Eating Questionnaire
Disinh. - *Disinhibition* subscale of the Three Factor Eating Questionnaire
Perc. Hung. - *Perceived Hunger* subscale of the Three Factor Eating Questionnaire
Social Adjust. - Social Adjustment Scale
S - *Somatization* subscale of the SCL-90
OC - *Obsessive-Compulsive* subscale of the SCL-90
IS - *Interpersonal Sensitivity* subscale of the SCL-90
D - *Depression* subscale of the SCL-90
A - *Anxiety* subscale of the SCL-90
H - *Hostility* subscale of the SCL-90
PA - *Phobic Anxiety* subscale of the SCL-90
PI - *Paranoid Ideation* subscale of the SCL-90
P - *Psychoticism* subscale of the SCL-90
GSI - *Global Severity Index* of the SCL-90

Appendix 28

Reliability of body size perception : bulimia nervosa patients

The reliability and validity of the image distortion method used to measure body size perception for the sample of 32 patients with bulimia nervosa reported in Section 2 of Chapter 5 was established as follows:

Test re-test reliability

Table 1 shows that for perceived size the two estimations made from a narrowly distorted image were significantly related, as were the two estimations made from a widely distorted image. This applied also to estimations of desired size.

Table 1
The reliability of two successive trials of body size perception

	Perceived size		Desired size	
	r	P	r	P
Image adjusted from narrow	.87	.001	.89	.001
Image adjusted from wide	.83	.001	.83	.001

Similar to the women in the community described in Appendix 23, despite the satisfactory degree of test re-test reliability for this group of patients, there was a considerable range in estimations across trials. Table 2 shows the mean differences between estimations made from the same direction of distortion.

Table 2
Differences between successive estimations

	Perceived size \bar{X}	sd	Desired size \bar{X}	sd
Narrow-narrow mean difference	12.68	11.73	1.32	6.84
Wide-wide mean difference	3.74	11.18	1.52	8.68

Thus, the image distortion method used to measure body size perception in patients with bulimia nervosa was deemed to show a satisfactory degree of test re-test reliability, despite variation between successive estimations.

Directional differences

Similar to the women in the community reported in Appendix 23, for the patients with bulimia nervosa the estimations made from widely and narrowly distorted images were significantly different, as shown in Table 3.

Table 3
Differences between estimations made from widely and narrowly distorted images

	Narrow image ¹	Wide image ¹	t	df	P
Perceived size	111.1 21.1	124.0 18.1	5.14	31	.001
Desired size	74.1 14.2	80.0 14.4	4.22	31	.001

1 Mean of 2 trials

Despite these directional differences, there was no reason to believe that they were problematic for interpreting estimations since it is relative rather than absolute estimations which are important in studies of body size perception.

Validity

Table 4 shows that perceived size, desired size and body size dissatisfaction were all significantly related to score on the BSQ which measures concern with shape, and to score on the body dissatisfaction subscale of the Eating Disorder Inventory (Garner et al,1983) which measures dissatisfaction with specific body parts (these measures were described in Chapter 2).

Table 4
Relationships between body size perception and concern with body shape

	BSQ		Body Dissatisfaction Subscale	
Perceived Size	.53	.001	.35	.04
Desired Size	-.68	.001	-.73	.001
Body size Dissatisfaction	.75	.001	.66	.001

Thus, for patients with bulimia nervosa the image distortion method used to measure body size perception was considered to show a satisfactory degree of test re-test reliability and concurrent validity.

Appendix 29

Information on patients with Bulimia Nervosa (N=32)

	N	% of sample	\bar{X}	sd
Age			22.8	4.1
MPMW			99.1	10.5
Desired MPMW			87.0	5.0
Weight				
Dissatisfaction				
lb			19.8	11.9
%			11.7	7.0
Highest MPMW			113.1	15.9
History of				
Obesity ^{1,2}				
No history	21	66		
History	11	34		
Lowest MPMW			82.0	12.2
History of				
Anorexia Nervosa				
No history	12	38		
Broad Criteria	20	63		
Narrow Criteria	11	34		
Duration			4.3	3.9
of Bingeing (years)				
≤year	10	31		
> year ≤5 years	12	38		
> 5 years	10	31		
Frequency of			26.7	21.3
Bingeing ³				
<daily	19	59		
≥daily	13	41		

	N	% of sample	\bar{x}	sd
Frequency of Vomiting ³			39.5	42.7
None	5	15		
< daily	12	38		
≥daily	15	47		
Frequency of Laxative abuse ³			6.1 ²	9.6
None	19	59		
< daily	12	38		
≥daily	1	3		
Exercise ³				
None	13	41		
< daily	19	59		
≥daily	0	0		
BSQ			134.0	33.8
EAT			47.8	16.6
EDI				
Drive for Thinness			14.3	5.8
Bulimia			11.1	3.5
Body Dissatisfaction			17.2	8.6
Ineffectiveness			12.5	7.8
Perfectionism			6.4	4.7
Interpersonal Distrust			7.2	4.8
Interoceptive Awareness			10.6	6.9
Maturity Fears			3.4	4.9
Three Factor Eating Questionnaire				
Dietary Restraint			13.8	4.2
Disinhibition			13.4	2.1
Perceived Hunger			7.2	3.5
BDI			20.9	8.9
Self-Esteem			20.5	4.6
Social Adjustment			2.49	0.38

	N	% of sample	\bar{X}	sd
SCL-90				
Somatization			1.13	0.74
Obsessive-Compulsive			1.55	0.79
Interpersonal Sensitivity			2.03	0.84
Depression			2.05	0.89
Anxiety			1.44	0.79
Hostility			1.24	0.95
Phobic Anxiety			0.78	0.71
Paranoid Ideation			1.20	0.83
Psychoticism			1.00	0.74
Global Severity Index			1.43	0.63

1 The data for one patient is missing on these measures

2 Previous MPMW $\geq 120\%$

3 Frequency over past month

Appendix 30

Body size perception and concern with shape during weight gain in anorexia nervosa: single case studies

Introduction

Perhaps the most striking feature of anorexia nervosa is the extreme importance placed on achieving and maintaining a slim body shape. Similar to bulimia nervosa, Russell's (1970) criteria for anorexia nervosa include *a morbid fear of becoming fat* as necessary for a diagnosis. Indeed, this aspect of the psychopathology of anorexia nervosa is very similar to that found in patients with bulimia nervosa, in that fatness is viewed as odious and reprehensible. In addition to a marked fear of fatness, patients with anorexia nervosa also pursue extreme thinness and derive great pleasure from an emaciated body. This feature is also included in formal diagnostic criteria for the disorder (Feighner et al, 1972; American Psychiatric Association, 1980), and distinguishes the typical psychopathology of anorexia nervosa from that of bulimia nervosa since few patients with bulimia nervosa pursue extreme thinness (Fairburn and Cooper, 1984a). Indeed, a pathological pursuit of thinness may be regarded as a pathognomic feature of anorexia nervosa in that no other patients derive pleasure from an emaciated body.

Despite the recognised importance of these concerns with shape among patients with anorexia nervosa, there has been little study of such concerns in relation to weight gain during treatment for the disorder. Morgan and Russell (1975) reported that in a sample of 41 patients a high level of concern with fatness persisted long after weight gain, but they used no standardised measure of this concern. Garner et al (1983) used a validated measure, ie. the *Body Dissatisfaction* subscale of the Eating Disorder Inventory or EDI, to measure dissatisfaction with specific body parts in relation to weight gain in anorexia nervosa. It was reported that a sample of 17 recovered patients were significantly less dissatisfied with their body compared with a large sample of currently ill patients, and were no more dissatisfied than normal young women. Thus, this study suggests that dissatisfaction with body parts may diminish following recovery from anorexia nervosa. However, the results were presented as part of a validation study for the measure of dissatisfaction, and the findings regarding the recovered patients are severely limited. These patients were not studied prospectively, the size of the group was small, their clinical features were not presented, it was not clear how long they were rated to have been recovered, and their current weight status was not reported. If body dissatisfaction does indeed decrease during or following weight gain in anorexia nervosa it is important to know when this change occurs. It may take a patient with anorexia nervosa a long time to become satisfied with a normal body size. Perhaps the greatest limitation of the study was that body dissatisfaction was the only aspect of concern with shape assessed, and while dissatisfaction is an important aspect of such concern, it is only one of many

aspects, as was discussed in Chapter 2.

In Chapters 3 and 5 changes in concern with shape were found to be associated with concurrent changes in mood among women in the community and patients with bulimia nervosa. In Chapter 5 it was suggested that mood and concern with shape may co-vary also among patients with anorexia nervosa who, similar to patients with bulimia nervosa, are characterised by a high level of depressive symptoms which have been observed to improve during treatment for the eating disorder (Eckert et al,1982).

In addition to extreme concerns with shape, some patients with anorexia nervosa have been reported to show disturbances in body size perception. Some studies have found that patients with anorexia nervosa overestimate their body size more than normal young women (eg. Slade and Russell,1973; Garner et al,1976; Wingate and Christie,1978), and are satisfied with their very thin body size (eg. Garner et al,1985). Four studies have measured body size perception before and after weight gain among patients with anorexia nervosa. One reported that overestimation decreased when weight was restored to a more normal level (Slade and Russell,1973), whereas three found that estimations were similar before and after weight gain (Button et al,1977; Garfinkel et al,1979; Strober et al,1979). Only one study has measured body size perception during the course of weight gain among these patients (Button,1986), and found that for most patients overestimation decreased after one week of hospitalisation, but found no consistent pattern to subsequent changes. However, this study used a method of measuring body size perception whose test re-test reliability and concurrent validity are questionable (ie. the moveable calliper technique) as was discussed in Chapter 1, and therefore findings should be interpreted with caution.

Although no study has reported body size dissatisfaction (in terms of the discrepancy between perceived and desired size) before and after weight gain among patients with anorexia nervosa, it is possible to derive this index of dissatisfaction from the data reported in one study (Garfinkel et al,1979). Patients with anorexia nervosa were more satisfied with their body size compared with controls both before weight gain and at follow-up one year later, but at follow-up they still weighed significantly less than the controls. This suggests that patients with anorexia nervosa may be satisfied with a thin size even one year after treatment for the disorder. No study has measured desired size and dissatisfaction with body size during the course of weight gain among these patients.

The aim of the present study was to make an intensive assessment of concern with shape and body size perception over the course of weight gain in patients with anorexia nervosa. Two single case studies were conducted.

Method

Both patients were admitted to a psychiatric hospital in Cambridge with a diagnosis of anorexia nervosa. They satisfied Russell's (1970) criteria, the diagnostic criteria of Feighner et al

(1972) and DSM III (1980) criteria for anorexia nervosa. Both suffered from the restricting subtype of the disorder ie. they did not experience bulimic episodes. Treatment involved re-feeding with supportive nursing care, and attitudes towards weight and shape were not formerly addressed.

Both patients were weighed regularly and completed a number of formal assessments before weight gain and shortly before discharge from hospital when their weight had stabilized at a near normal level. The first patient was allowed two weeks to settle into hospital before being asked to complete the assessments, during which time she did not receive formal treatment and she lost weight. The second patient was assessed one day before admission. The assessments were:

- (i) The Body Shape Questionnaire or BSQ (see Chapter 2). The time scale of this questionnaire referred to feelings over the past week, and the patients completed this questionnaire on the same day of each week during their stay in hospital.
- (ii) The Beck Depression Inventory or BDI (Beck et al,1961). Again, the time scale of this questionnaire referred to feelings over the past week and the patients completed this questionnaire every week. The 18-item version of this questionnaire was used, as was described in Section 1 of Chapter 5.
- (iii) Body size perception was assessed using the image distortion method described in Section 2 of Chapter 4. The patients estimated their size and indicated their desired size. An index of body size dissatisfaction was derived by subtracting desired size from perceived size. The assessment of body size perception was completed at three-weekly intervals on the same day of each week, at the same time of day, ie. mid-morning.
- (iv) The Eating Attitudes Test or EAT (Garner and Garfinkel,1979), which measures disturbed eating attitudes and behaviour. This measure was completed before weight gain and again shortly before discharge.
- (v) The Eating Disorder Inventory or EDI (Garner et al,1983) which has eight subscales measuring psychopathological disturbance characteristic of the eating disorders, and is described in detail in Section 1 of Chapter 5. This measure was completed before weight gain and again shortly before discharge.
- (vi) The Rosenberg Self Esteem Scale (Rosenberg,1965) which measures self-esteem. This measure was completed before weight gain and again shortly before discharge.

Study 1

The patient

Ms. A. was admitted to hospital at the age of 17 weighing five stone and eight pounds or 64.7 percent of average weight. Prior to developing anorexia nervosa she had had no psychiatric history. The home life of Ms. A. was not a happy one. Her parents had divorced a few years

previously and there was still marked animosity between them which caused Ms. A. considerable distress. She had never had a boyfriend, had one close girlfriend and enjoyed little social life. Despite being an intelligent girl with nine O'levels, she had been unemployed since leaving school one year previously and was anxious to find work. During the year preceding admission Ms. A.'s mood had become increasingly depressed and she was very concerned about her family situation. She had been treated with clomipramine. Her feelings of hopelessness had led to an overdose, following which she spent three weeks in a private nursing home where she gained some weight. After discharge she rapidly lost this weight and was admitted to a National Health Service hospital seven months later.

At the time of admission Ms. A. had had amenorrhoea for eighteen months. She had induced vomiting in the past but was not currently doing so, and did not experience bulimic episodes. She admitted that she was underweight but described feeling very fat, said that she saw herself as fat and hated her body. She also had feelings of hopelessness.

During the first week of hospitalisation Ms. A. lost weight, but by the third week she responded well to treatment and was highly motivated to overcome anorexia nervosa. Before admission she had been eating a very restricted diet but by the third week she had re-introduced more varied foods and expressed a desire to eat normally, to put on weight and for menstruation to return. In addition, her mood was improved.

This excellent response to treatment was not maintained. Depressive symptoms gradually returned and she developed panic feelings about becoming too fat. Although she realised that she was still thin she described feeling very fat. Ms. A. began exercising on the ward, ate fewer calories and ate a less varied diet. After a week-end visit home which was not a happy one she induced vomiting, although this did not become a regular habit. She was discharged 15 weeks after admission, after which she became an outpatient.

Results from the assessments

In terms of weight gain, Ms. A.'s progress in treatment was satisfactory, as illustrated in Figure 1. After settling into hospital her weight steadily increased so that by the time of discharge she had gained 27 pounds and her weight had stabilized at 87 percent of average, ie. almost within the normal range ($\pm 10\%$). Nevertheless, she was still underweight.

Table 1 shows her scores on the BSQ and BDI over the course of weight gain. At the first assessment Ms. A. showed an extreme level of concern with her shape. Her score of 168 on the BSQ is comparable to the high scores shown by many patients with bulimia nervosa (Chapter 5). By the third week of admission her score on this questionnaire was markedly decreased to a normal level of concern comparable to the general population mean (Chapter 2). However, from this time onwards her score on the BSQ gradually increased, so that by the time of discharge her level of concern with her shape was similar to her level of concern shortly after admission. One striking aspect of change in her BSQ score is how closely it co-varied with change in her mood as measured by the BDI, illustrated in Figure 2. Since the BSQ and BDI are measured on

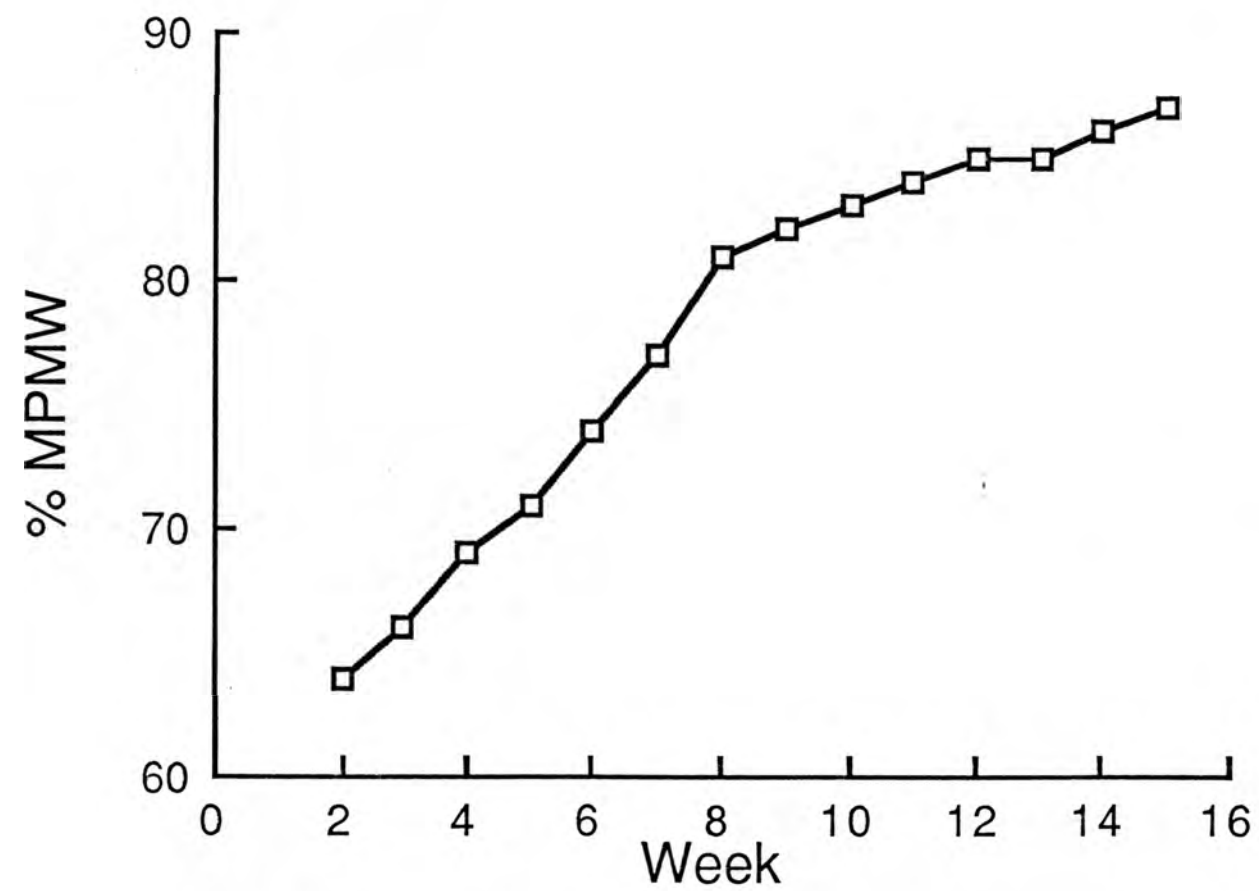


Figure 1
Weight gain during treatment for anorexia nervosa: Ms.A.

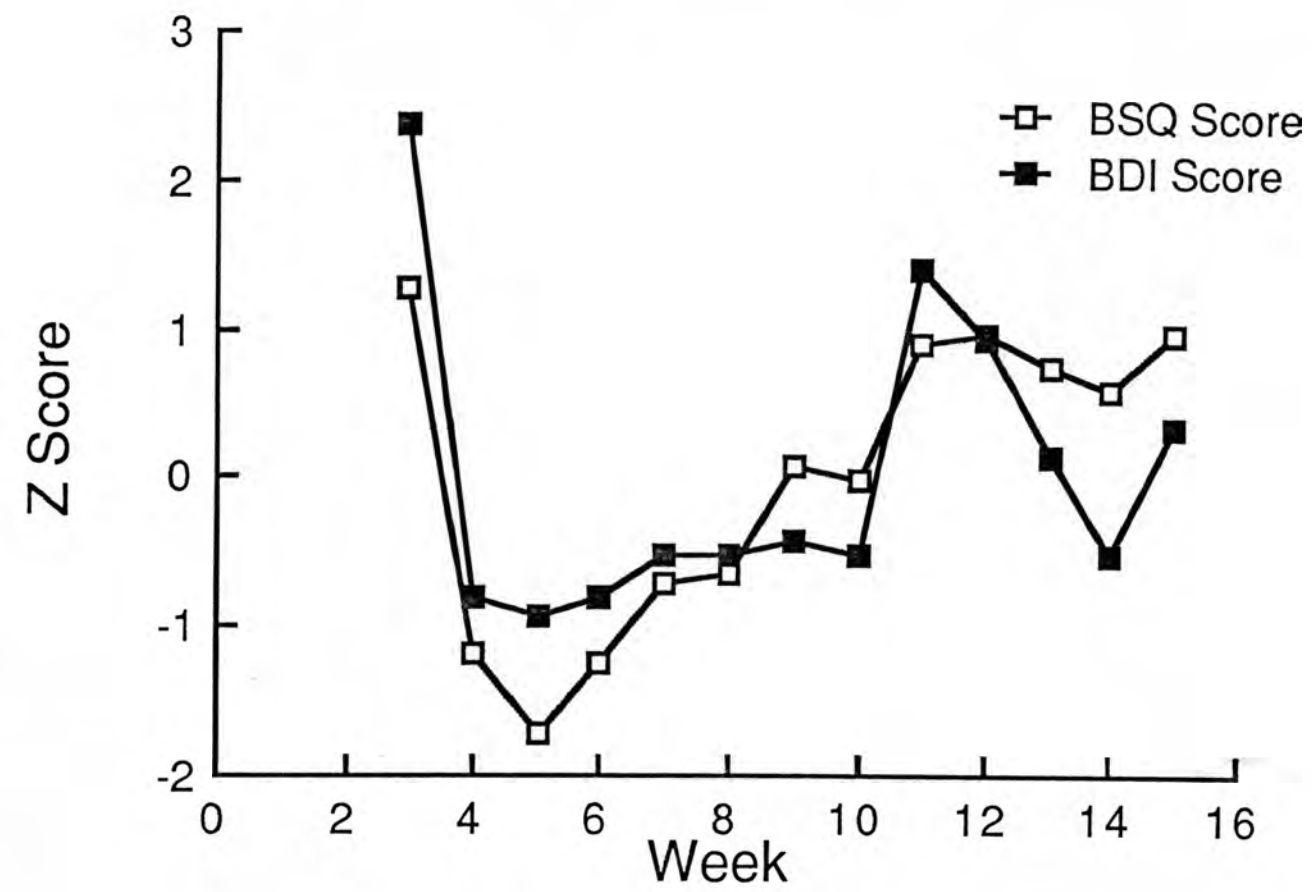


Figure 2
Concurrent changes in concern with shape and mood: Ms.A.

different scales, scores are plotted as standardised or Z scores. Scores on the two measures were highly correlated (Spearman's $r=.95$, $P<.001$). Thus, just as her BSQ score showed a marked decrease from a high level followed by a gradual increase, level of depression showed a similar trend.

Table 1
Weight, depression and concern with shape during treatment: Ms.A.

	% MPMW	BSQ	BDI
Week 1	64.7	-	-
Week 2	64.0	-	-
Week 3	66.3	168	40
Week 4	68.8	79	7
Week 5	71.1	59	6
Week 6	74.2	77	7
Week 7	76.9	96	10
Week 8	80.6	98	10
Week 9	81.8	125	11
Week 10	82.7	121	10
Week 11	83.5	154	30
Week 12	85.1	157	25
Week 13	85.3	149	17
Week 14	86.2	143	10
Week 15	86.7	157	19

Table 2 shows Ms. A.'s perception of her body size over the course of weight gain, and Figure 3 illustrates changes in her perceived size and desired size. She overestimated her size more than the mean for the group of normal young women described in Section 2 of Chapter 5, but was not markedly dissatisfied with her perceived size. During the first half of treatment Ms. A.'s perceived size remained approximately constant, but during the latter half she increasingly overestimated her size. Her desired size remained unchanged relative to her actual size. Since her actual size increased her desired size increased likewise. In view of her change in actual size it is not particularly useful to discuss change in desired size. Figure 4 shows that similar to perceived size, Ms. E's dissatisfaction with her body size remained largely unchanged during the first half of treatment, and then showed a considerable increase.

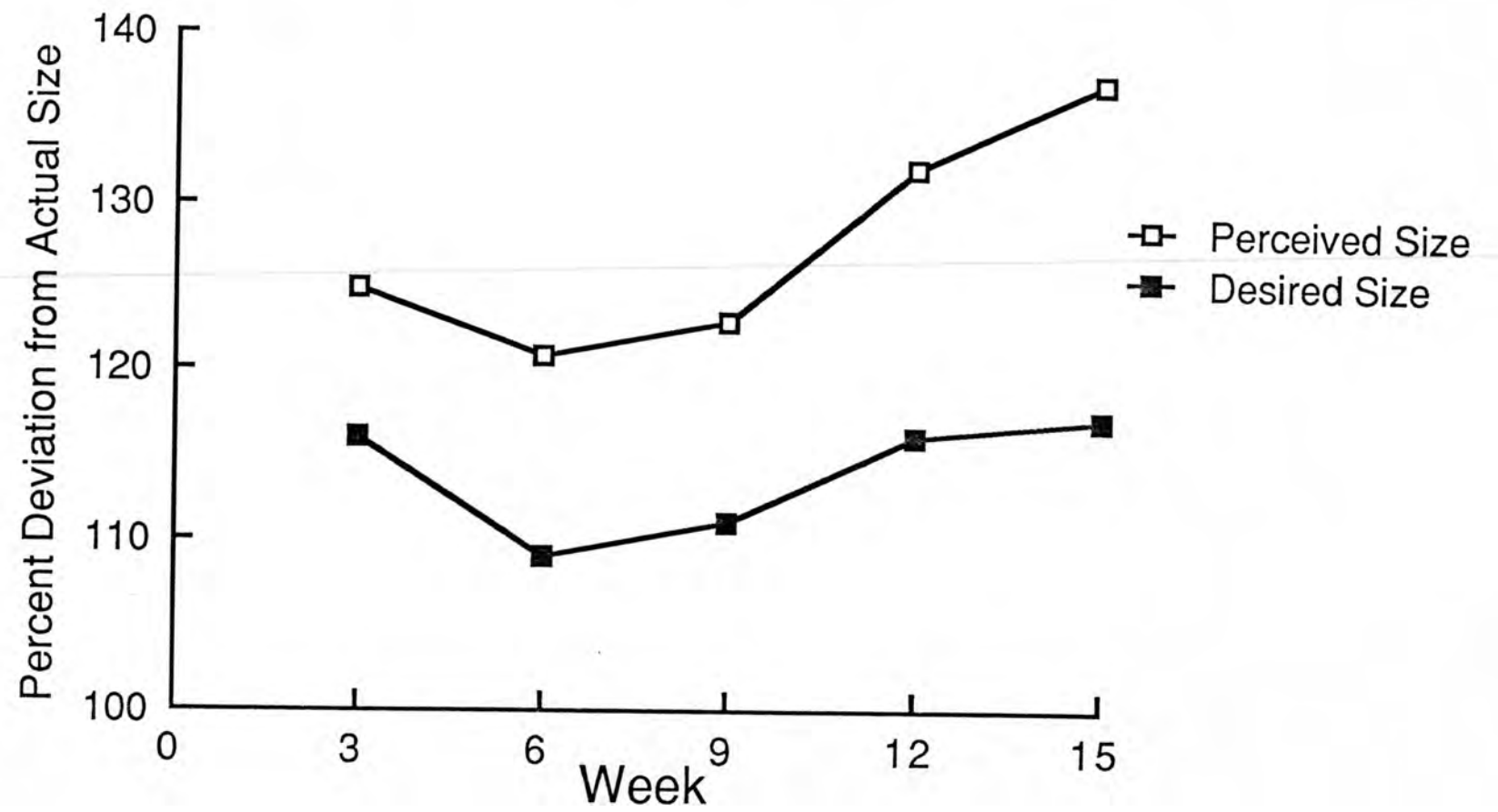


Figure 3
Body size perception during weight gain: Ms.A.

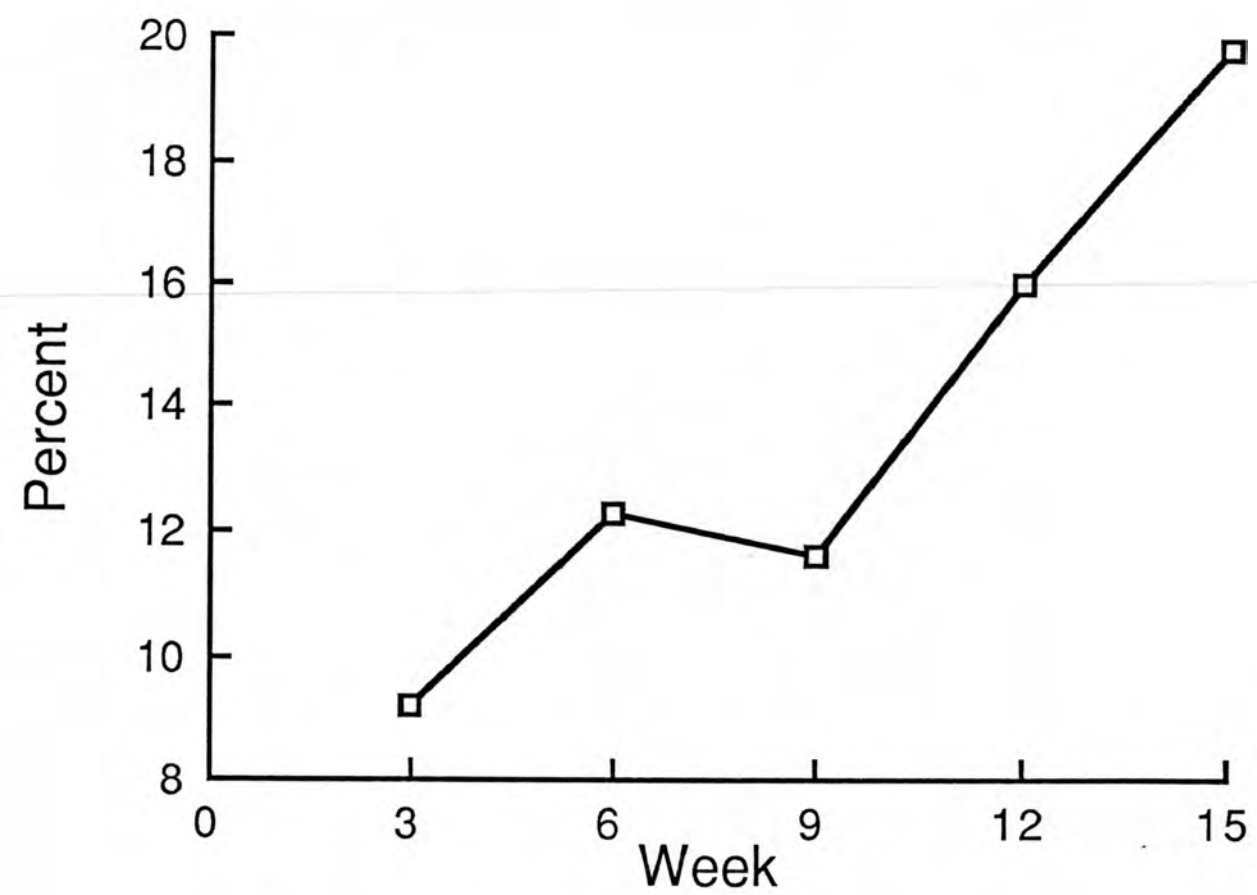


Figure 4
Body size dissatisfaction during weight gain: Ms.A.

Table 2
Body size perception during weight gain: Ms.A.

	Percent		
	Perceived Size	Desired Size	Body size Dissatisfaction
Week 3	124.8	115.6	9.2
Week 6	121.4	109.1	12.3
Week 9	122.7	111.1	11.6
Week 12	131.6	115.6	16.0
Week 15	137.2	117.4	19.8

Table 3 compares results from the assessments of body size perception and the self-report measures completed before and after weight gain. It is apparent that, with the exception of her mood, Ms. A.'s responses on these measures were considerably more disturbed after weight gain compared with before. Even her mood, which showed some improvement, was still depressed.

Table 3
Assessments before and after weight gain: Ms.A.

	Before weight gain	After weight gain
MPMW	66.3	86.7
Perceived size (%)	124.8	137.2
Desired size (%)	115.6	117.4
Body size dissatisfaction (%)	9.2	19.8
BSQ	168	157
BDI	40	19
EAT	68	80
Self-Esteem	28	15
EDI		
Drive for Thinness	9	21
Bulimia	1	0
Body Dissatisfaction	16	27
Ineffectiveness	12	26
Perfectionism	4	5
Interpersonal Distrust	1	17
Interoceptive Awareness	22	29
Maturity Fears	5	24

Thus, despite satisfactory weight gain, Ms. A. showed greater disturbance in her perception of her body size, was still highly concerned with her shape and, with the exception of her mood, her psychological state had deteriorated over the course of her treatment.

Study 2

The patient

Ms. B was a 20 year old married lady. She had left school at 16 with six O'levels and she and her husband had worked intermittently as artists. They were both currently unemployed. They had met when both were patients at a psychiatric hospital and they had currently been married for 18 months. Ms. B's mother was described as *unstable* and she had a psychiatric history. Ms. B. had one brother and one sister, and the latter had a psychiatric history of many overdoses.

Ms. B. had a disturbed weight history. She described herself as a fat child up to the age of 13 when she had weighed 15 stone. Her childhood had been marred by other children teasing her about her weight. It was at the age of 13 that Ms. B. first dieted, when she lost five stone. Her weight oscillated between the ages of 13 and 16. At the age of 16 she first experienced amenorrhoea, when she weighed eight and a half stone. At the age of 18 she was admitted to

hospital with a diagnosis of anorexia nervosa and at this time weighed six stone and three pounds. Ms. B. was discharged at the weight of eight and a half stone and she continued to see a psychologist for a year. Six months after discharge she spent six weeks as a psychiatric in-patient with a diagnosis of depression.

At the time of her current admission to hospital Ms. B. weighed six stone and six pounds, or 66 percent of average weight. She said that she did not feel thin but rationally accepted that she was. She did not appear very depressed or agitated, and displayed no suicidal ideation, but reported feeling desperate to change her current condition. Prior to admission she ate very little. She did not experience bulimic episodes and did not vomit. Ms. B. was highly motivated to gain weight and had been greatly in favour of admission. Her motivation to gain weight lasted throughout her stay in hospital. Midway during her admission she decided to separate from her husband. She reached her target weight of eight and a half stone after 16 weeks, shortly after which she was discharged and became a day patient.

Results from the assessments

Ms. B.'s response to treatment was highly satisfactory. As illustrated in Figure 5, her weight steadily increased so that by the time of discharge she had gained 32 pounds and her weight was 89.3 percent of average weight, ie. almost within the normal range ($\pm 10\%$). It is noteworthy that the two weeks midway during her stay in hospital when she did not gain weight coincided with her decision to separate from her husband.

Table 4 shows her scores on the BSQ and BDI over the course of weight gain. Compared with before weight gain, after weight gain she showed much less concern with her shape and her mood had markedly improved. Despite these changes, scores on the two measures showed some fluctuation during weight gain. Figure 6 illustrates that her mood and level of concern with her shape largely co-varied (Spearman's $r = .70$, $P < .01$). Again, BSQ and BDI scores are plotted as Z scores. Both measures are elevated midway during admission which corresponds with the time Ms. B. decided to separate from her husband and when her mood became very depressed.

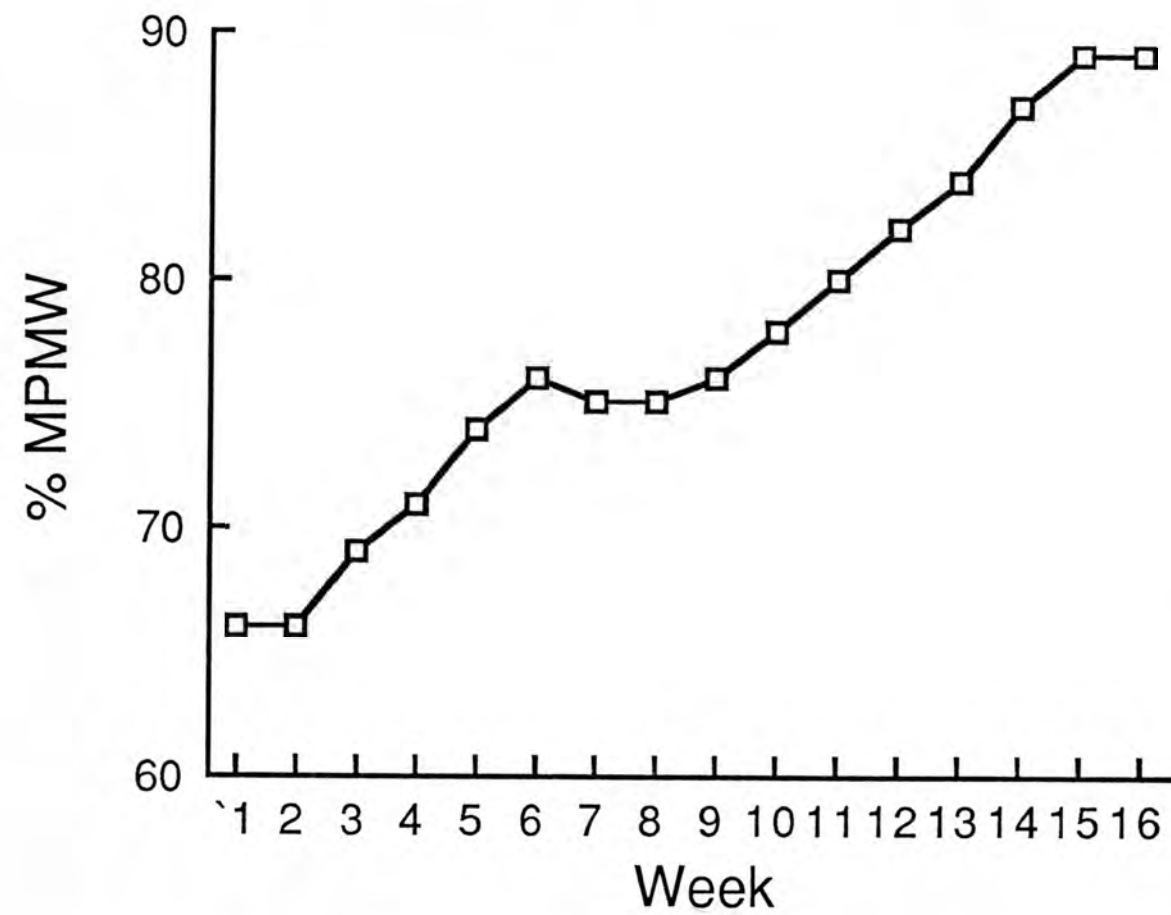


Figure 5
Weight gain during treatment for anorexia nervosa: Ms.B.

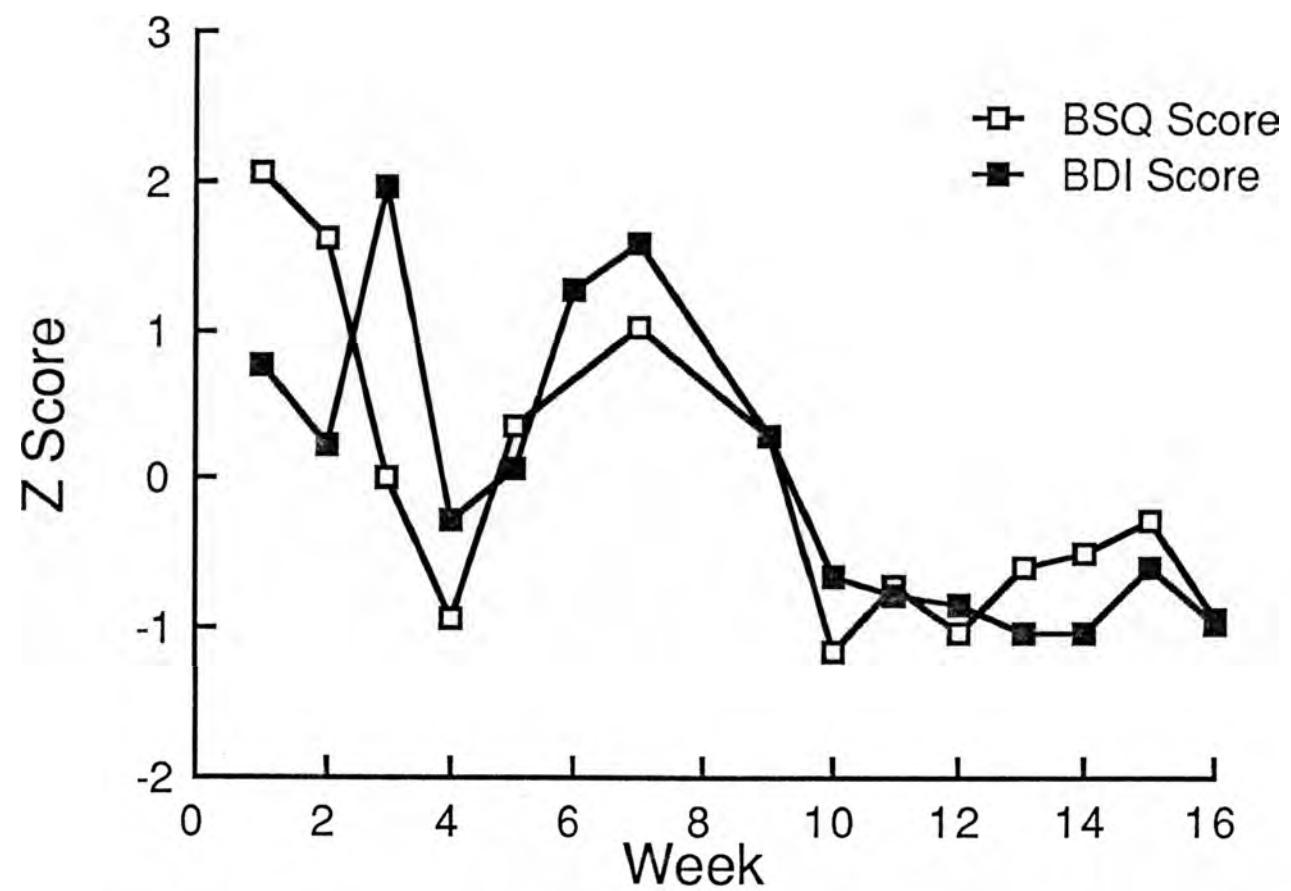


Figure 6
Concurrent changes in concern with shape and mood: Ms.B.

Table 4
Weight, depression and concern with shape during treatment: Ms.B.

	% MPMW	BSQ Score	BDI Score
Week 1	66.1	108	31
Week 2	65.8	102	22
Week 3	68.9	80	50
Week 4	70.7	67	14
Week 5	74.2	85	20
Week 6	76.3	90	39
Week 7	74.8	94	44
Week 8	74.8	*	*
Week 9	76.1	84	23
Week 10	78.3	64	8
Week 11	80.4	70	6
Week 12	82.1	66	5
Week 13	83.9	72	2
Week 14	87.2	73	2
Week 15	88.8	76	9
Week 16	89.3	67	3

* Ms. B.'s scores on the BSQ and BDI are missing for 1 week since the nursing staff did not give her the questionnaires on the day requested.

Table 5 shows Ms. B.'s perception of her body size over the course of weight gain. Changes in perceived size and desired size are illustrated in Figure 7. It is clear that both measures fluctuate, and that they inversely co-varied (Spearman's $r = -.83$, $P < .02$). Figure 8 illustrates her level of dissatisfaction with her body size. Despite fluctuations, before weight gain she was dissatisfied with her body size being too large, but after weight gain she was dissatisfied with her size being too small.

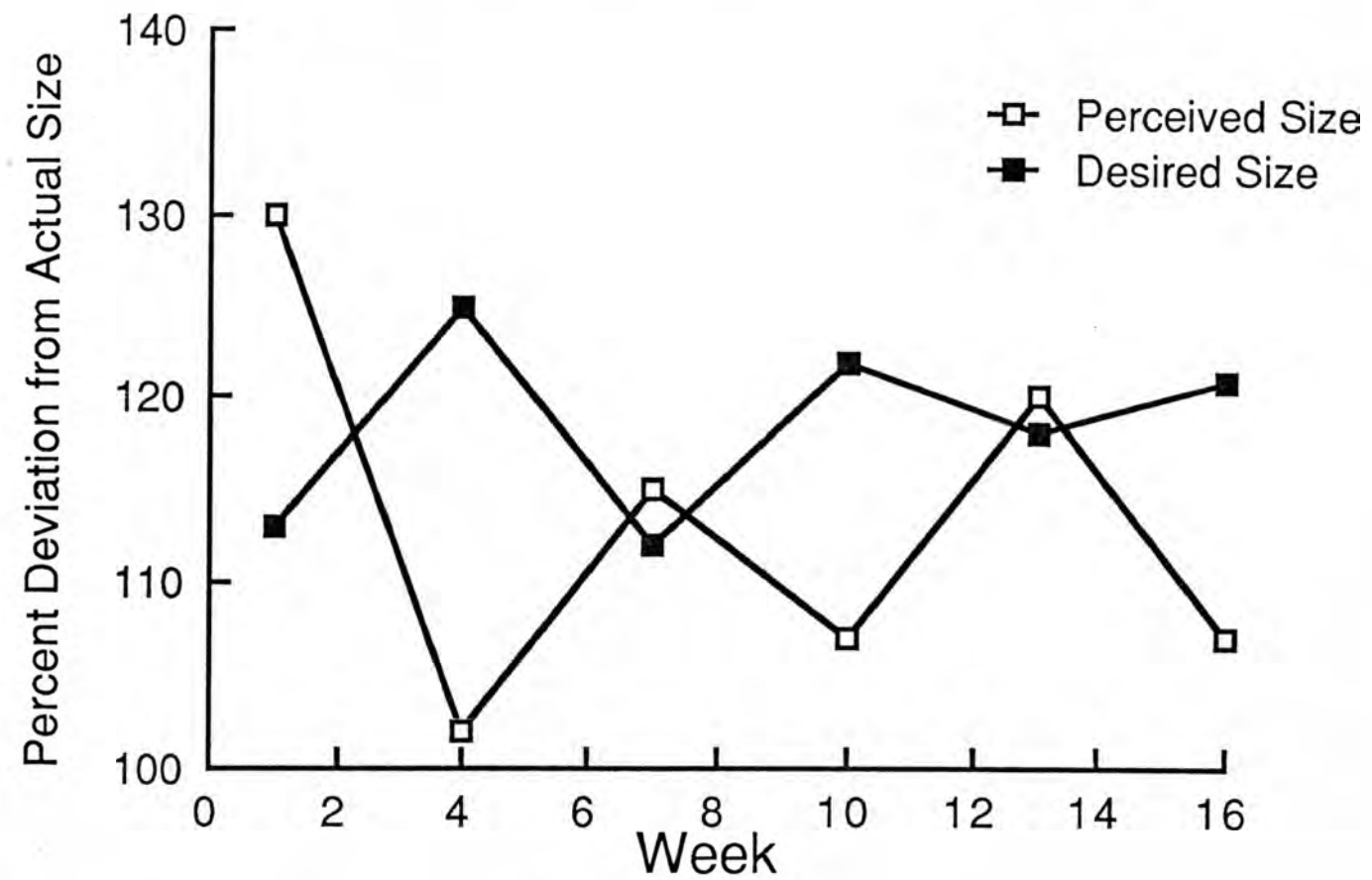


Figure 7
Body size perception during weight gain: Ms.B.

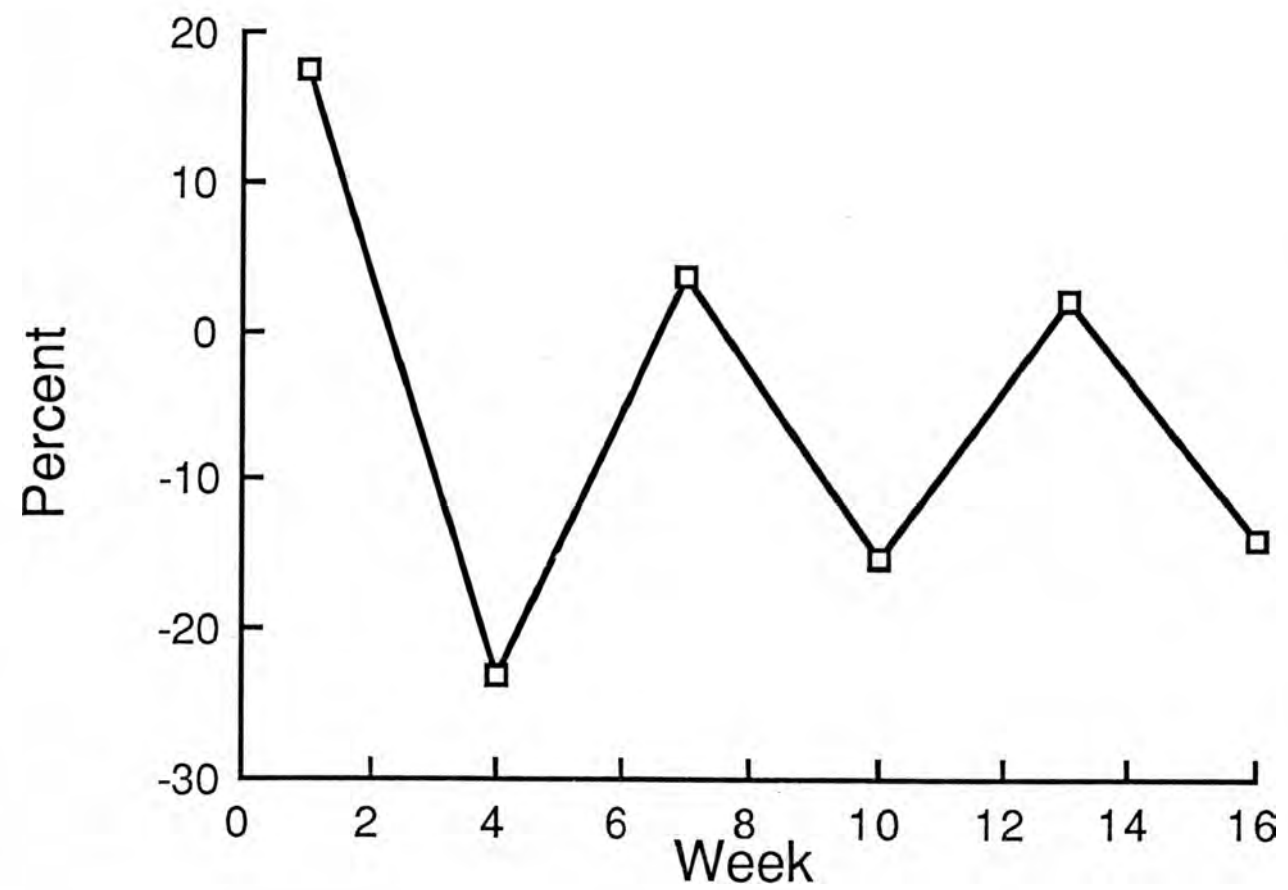


Figure 8
Body size dissatisfaction during weight gain: Ms.B.

Table 5
Body size perception during weight gain: Ms.B.

	Percent		
	Perceived Size	Desired Size	Body size Dissatisfaction
Week 1	130.2	112.8	17.4
Week 4	101.6	124.6	-23.0
Week 7	115.4	111.9	3.5
Week 10	106.5	121.6	-15.1
Week 13	120.4	118.2	2.2
Week 16	107.1	121.0	-13.9

Table 6 shows self-report measures and body size perception before and after weight gain. It is apparent that, in addition to a marked improvement in Ms. B.'s weight, her mood also markedly improved, her concern with her shape decreased, she overestimated her body size less, showed a larger desired size, was dissatisfied with her body being too thin rather than too large, her attitudes and behaviour towards eating had improved, and she showed less disturbance on other indices associated with anorexia nervosa. Thus, compared with before weight gain, after weight gain Ms. B. showed less perceptual disturbance in relation to her body size, less concern with her shape, and her psychological state was greatly improved.

Table 6
Assessments before and after weight gain: Ms.B.

	Before weight gain	After weight gain
MPMW	66.1	89.3
Perceived size (%)	130.2	107.1
Desired size (%)	112.8	121.0
Body size dissatisfaction (%)	17.4	-13.9
BSQ	108	67
BDI	31	3
EAT	76	8
Self-Esteem	19	30
EDI		
Drive for Thinness	18	0
Bulimia	2	0
Body Dissatisfaction	16	5
Ineffectiveness	18	1
Perfectionism	5	1
Interpersonal Distrust	9	2
Interoceptive Awareness	19	0
Maturity Fears	2	2

Discussion

This study reports intensive assessment of body size perception and concern with shape in relation to weight gain during treatment for anorexia nervosa. Although findings from two single case studies are limited in that it is not clear how typical individual cases are of cases in general, the findings are nevertheless interesting and have implications for interpreting results from larger scale published studies. Miller and Morley (1986) have argued that the problem of generalization from single case studies is not a particularly serious one, since the assumption of single case studies is that the patients are similar to other patients in the nature of their disturbance and response to treatment, which is an assumption also made by larger studies.

The single case studies had a number of favourable points. First, the patients were consecutive admissions to a National Health Service hospital and were therefore not selected on demographic variables. The hospital did not specialise in treating eating disorders, and the patients were not referred as chronic cases difficult to treat. Therefore, there is no reason to believe that the two patients were dissimilar from the majority of cases of anorexia nervosa. Second, serial prospective assessments were made to plot the course of change during treatment. While it may not be meaningful to interpret an estimation of 130 percent as representing a disturbance in body

size perception, it is informative to compare an estimation of 130 percent before weight gain with an estimation of 107 percent after weight gain. Third, it is meaningful to compare results from individuals with those from larger groups of subjects who completed the same assessments under the same testing conditions. Thus, comparing a score of 168 on the BSQ with the mean score for women in the community (Chapter 2) indicates that this score represents marked concern with shape. Fourth, by examining single cases so intensively it is possible to relate particular changes in the data to significant factors in the individual. For example, Ms. B. grew very depressed midway during her admission, and this appeared to correspond to a stressful personal experience aside from her illness. In the absence of knowledge about the individual it may be difficult to explain changes in the data.

This report presents two individuals with anorexia nervosa who responded differently to weight gain in terms of their perception of their body size and their concern with their shape. Both had a history of anorexia nervosa lasting for many months although neither could be considered a chronic case, and for both patients it was their second admission to hospital for the disorder. They showed a satisfactory rate of weight gain, and by the end of treatment their weight was considerably improved, although it is noteworthy that by the time of discharge both were maintaining a body weight which was still relatively low.

Findings regarding concern with shape showed that both patients began treatment showing some concern with their shape, and for one patient this concern was very high. Both showed a marked decrease in this concern after they began putting on weight, but for one patient the level of concern returned to and remained at a very high level. More importantly, despite different levels of concern with shape between the patients and despite very different changes in the level of such concern, for both patients changes in concern with shape co-varied with changes in mood. Thus, when concern with shape was high, level of depression was also high. The relationship between changes in concern with shape and mood was similar to that described for women in the community reported in Section 6 of Chapter 3 and patients with bulimia nervosa reported in Section 3 of Chapter 5. In contrast with concern with shape, findings regarding body size perception were quite different between the patients. One overestimated her size increasingly more with weight gain, while the other's estimations fluctuated. One patient became increasingly more dissatisfied with her body size with weight gain, while the other again showed fluctuation in her level of dissatisfaction and then became dissatisfied with her body size being too thin. These differences between patients must be considered in relation to differences in their mental state and attitudes to weight and eating. The patient whose concern with her shape declined to a mild level, who did not overestimate her body size more with weight gain and who became dissatisfied with her body size being too thin, showed a marked improvement in her mood and her attitudes to body shape, weight and eating. Thus, improvement on one factor was associated with improvement on all other factors measured. In contrast, the patient who overestimated her size more with weight gain, who became increasingly more dissatisfied with her size, and who showed

a very high level of concern with her shape after weight gain showed a deterioration in her mental state and her attitudes to eating and weight. Compared with before weight gain, after weight gain her mood was little improved and she showed greater disturbance in her attitudes to weight and eating. The differences between the patients at the end of treatment was not incompatible with studies of treatment for anorexia nervosa. The disorder is well known as one which has a variable outcome (Hsu,1980).

One important and obvious implication from this study is that weight gain should form only one part of treatment for anorexia nervosa, since weight gain did not necessarily lead to a significant improvement on the other clinical features of the disorder. It seems probable that in the absence of change in attitudes towards shape a patient's prognosis may be poor. In contrast with Ms. B., Ms. A. overestimated her body size increasingly more, became increasingly more dissatisfied with her larger size and continued to show a very high level of concern with her shape. It is conceivable that these disturbances may motivate future dietary restraint. Ingrained beliefs about shape may be resistant to change despite an improvement in weight.

The results from these two single case studies have implications for larger scale published studies. Compared with before weight gain, after weight gain one patient showed less disturbance on measures of body size perception and concern with her shape while the other tended to show greater disturbance. However, both patients showed considerable change during weight gain. Thus, although some published studies of body size perception in anorexia nervosa have reported that estimations of body size are unchanged by weight gain while others have reported a significant decrease in estimations after weight gain, measuring body size perception before and after weight gain may mask considerable change during weight gain.

The case studies raise questions which may be addressed in future research. The first concerns whether changes in body size perception and concern with shape vary in relation to type of treatment. It is possible that treatment involving cognitive restructuring may induce greater changes in concern with shape and body size perception compared with the treatment involving supportive nursing care reported in this study. The second question concerns change in relation to time. The patient who after weight gain showed a high level of concern with her shape and a high level of dissatisfaction with her body size may show an improvement on these factors given time to adjust to her larger body size.

To conclude, perhaps the most important finding from the case studies presented was that despite very different outcomes from anorexia nervosa in terms of concern with shape, body size perception and attitudes towards weight and eating, for both patients concern with shape and mood closely co-varied over the course of weight gain. Indeed, aside from satisfactory weight gain, concurrent changes in mood and concern with shape was the only consistent finding between these two patients. The association between concern with shape and mood was correlational, and does not indicate whether a high level of disturbance on one factor may give rise to a high level of disturbance on the other; or whether the level of disturbance on both

factors may be influenced by some other factor. Nevertheless, the association between changes in mood and concern with shape is consistent with ideas in Beck's cognitive model of depression and the hypothesis outlined in Chapter 1 that depressed mood may exacerbate a high level of concern with shape.