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. Birtchnell 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:

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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
Interoceptive 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 of 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					
	< 90 (N=13)	90-110 (N=41)	> 110 (N=18)	F	df	P
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	>1 Year ≤5 Years	>5 Years	F	df	P
	(N=18)	(N=36)	(N=18)			
	$\bar{X}$/sd	$\bar{X}$/sd	$\bar{X}$/sd			
BSQ	154.6*	133.0	133.4	4.62	2,69	.02
	21.2	28.0	25.9			
MPMW	104.5	102.0	101.2	0.26	2,68	>.05
	12.3	16.4	14.0			

* 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	≥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

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, Interoceptive 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, Interoceptive 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

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[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.

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[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).

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[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 criteria[9] 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]

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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 (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

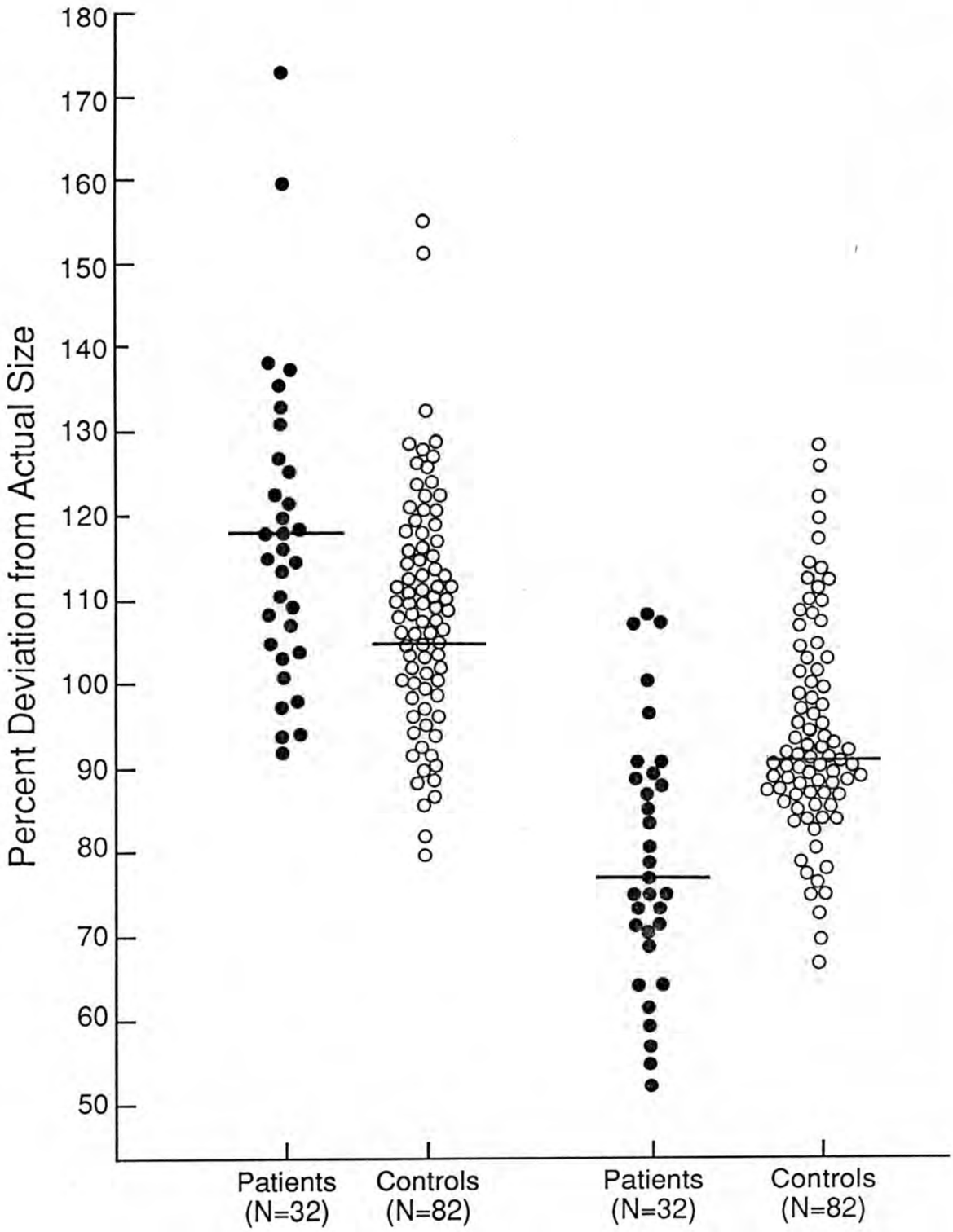

Figure 5.2.2
Variability in body size dissatisfaction: patients with bulimia nervosa and controls

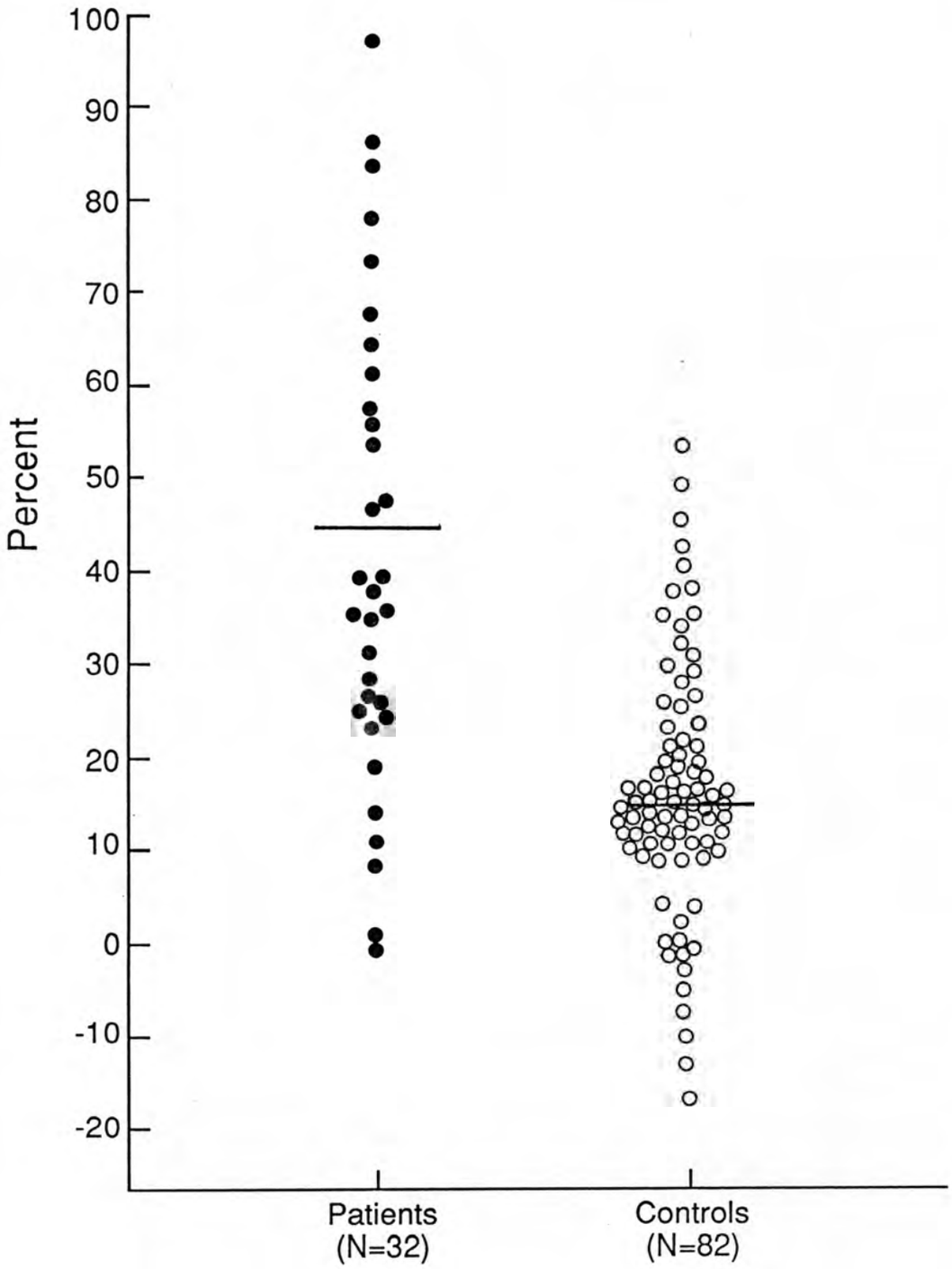

Table 5.2.3
Group differences in body size perception

	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 dissatisfaction[12] 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

	< daily (N=19) $\bar{X}$/sd	≥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	≥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		Body size dissatisfaction	
	r	P	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 paraesthenia, 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 intractible 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 judgeing

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 patients[1] 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).

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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

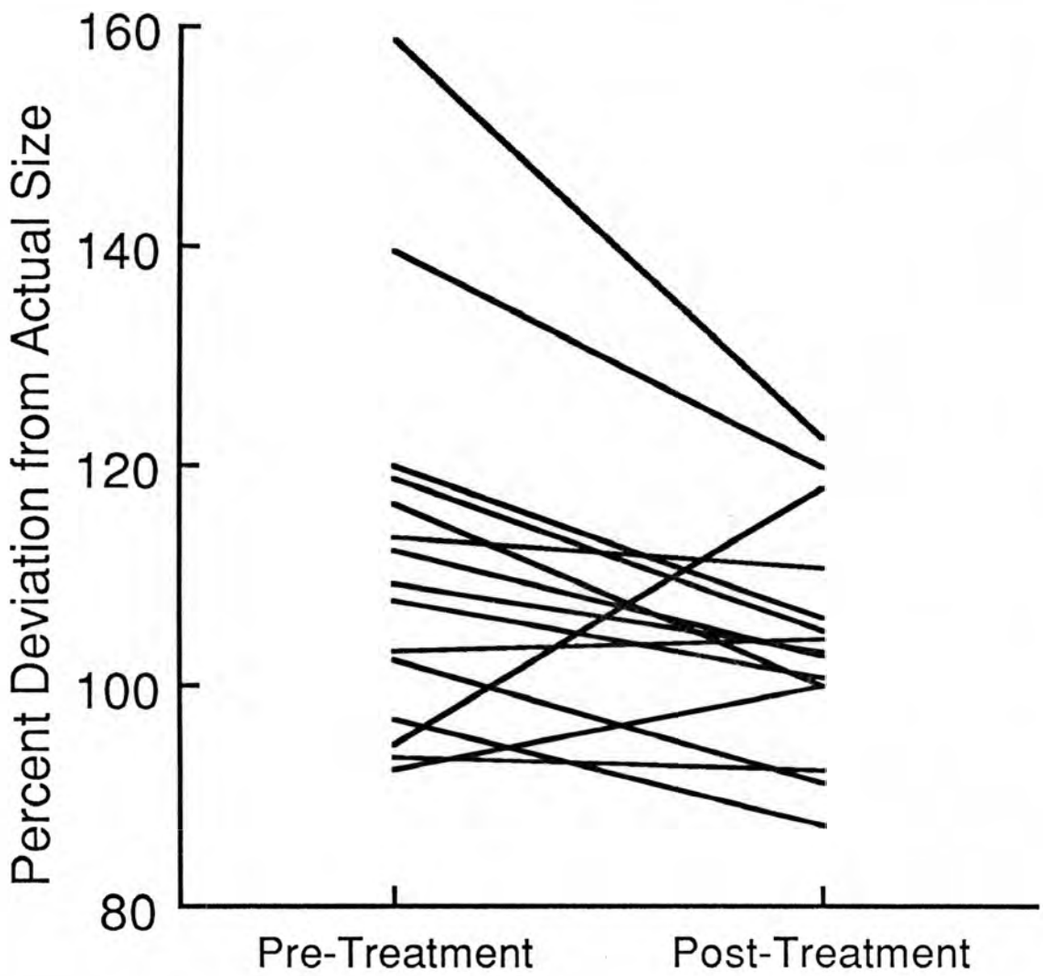


Table 5.3.3
Perceived size of patients and controls

	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

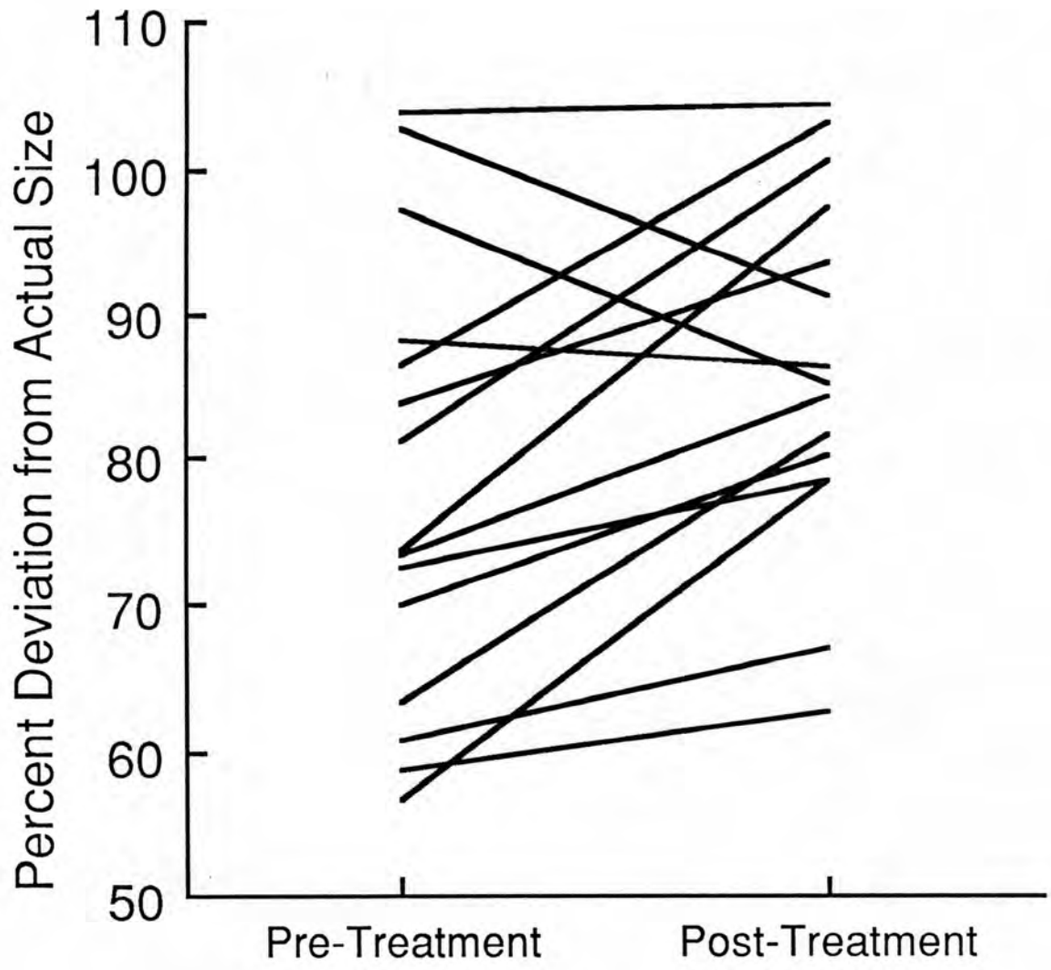


Figure 5.3.3

Change in body size dissatisfaction following treatment for bulimia nervosa

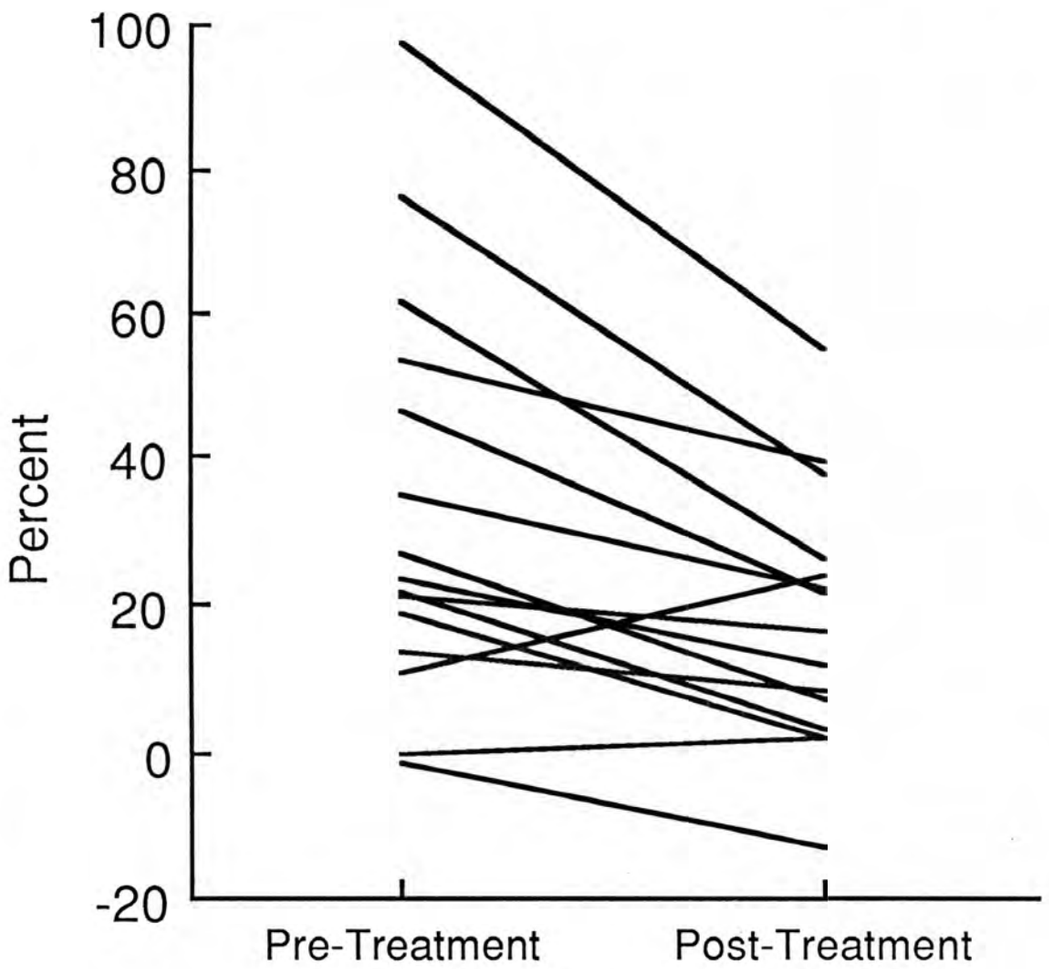


Table 5.3.5
Body size dissatisfaction for patients and controls

	Patients (N=15) $\bar{X}$/sd	Controls (N=82) $\bar{X}$/sd	t	df	P
Before Treatment	33.7 28.4	14.7 14.3	2.54	15.3	.02
After Treatment	17.8 17.7	14.7 14.3	0.75	95	>.05

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.

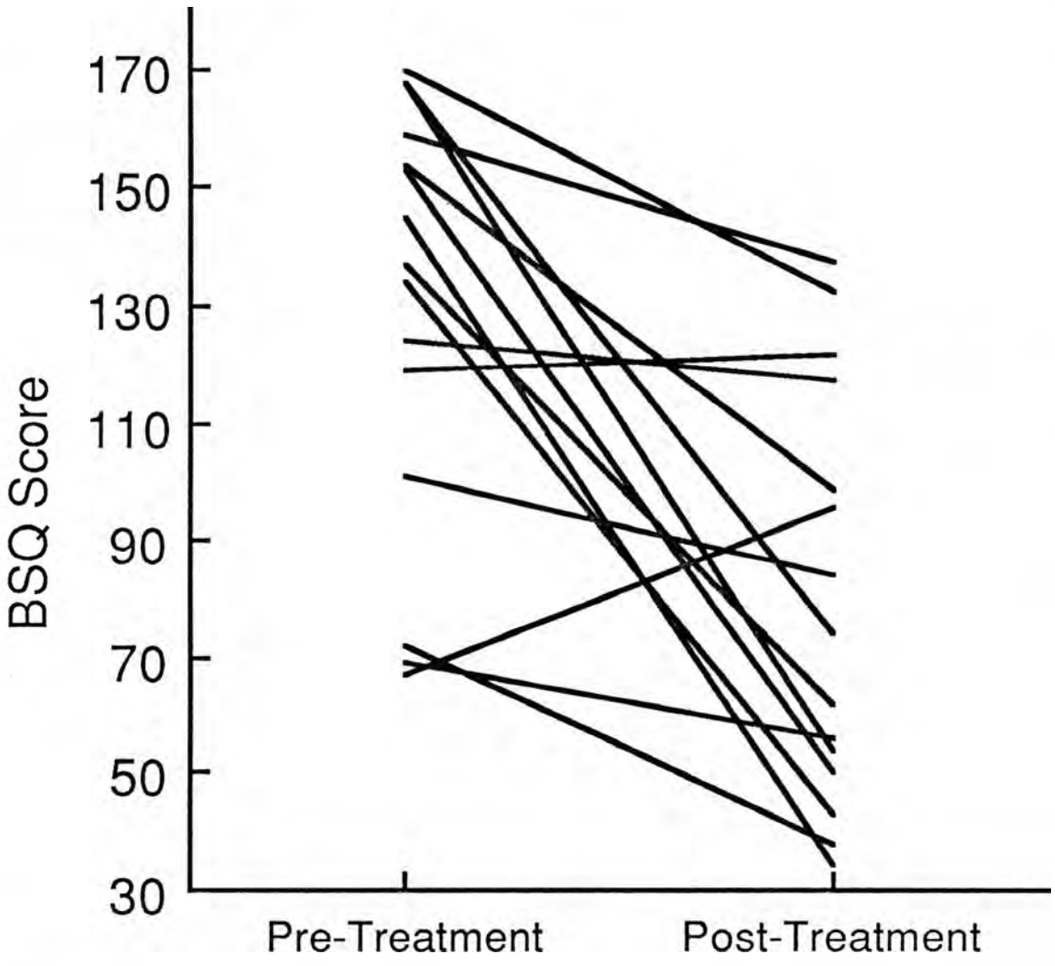
Table 5.3.6
BSQ scores of patients and controls

	Patients (N=15) $\bar{X}$/sd	Controls (N=82) $\bar{X}$/sd	t	df	P
Before Treatment	129.3 36.6	88.8 29.2	4.74	95	.001
After Treatment	78.4 35.3	88.8 29.2	1.23	95	>.05

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 measured 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

	Poor or Moderate Recovery (N=8)	Good Recovery (N=7)	Z	P
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			
	Poor or Moderate Recovery (N=6)	Good Recovery (N=9)	Z	P
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			
	Poor or Moderate Recovery (N=6)	Good Recovery (N=9)	Z	P
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.

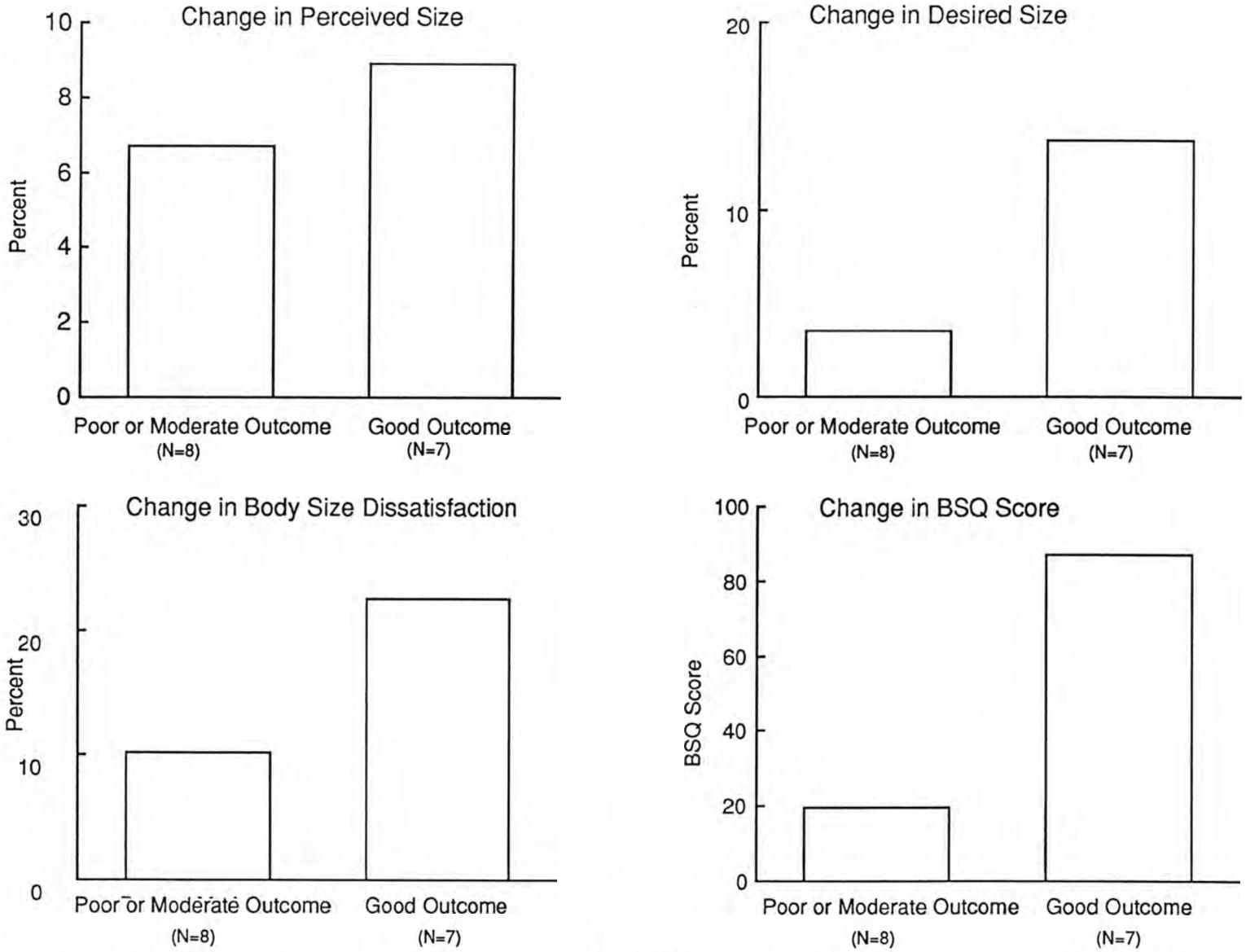


Figure 5.3.5

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: Poor or Moderate Recovery (N=8)	Mean Ranks: Good Recovery (N=7)	Z	P
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.

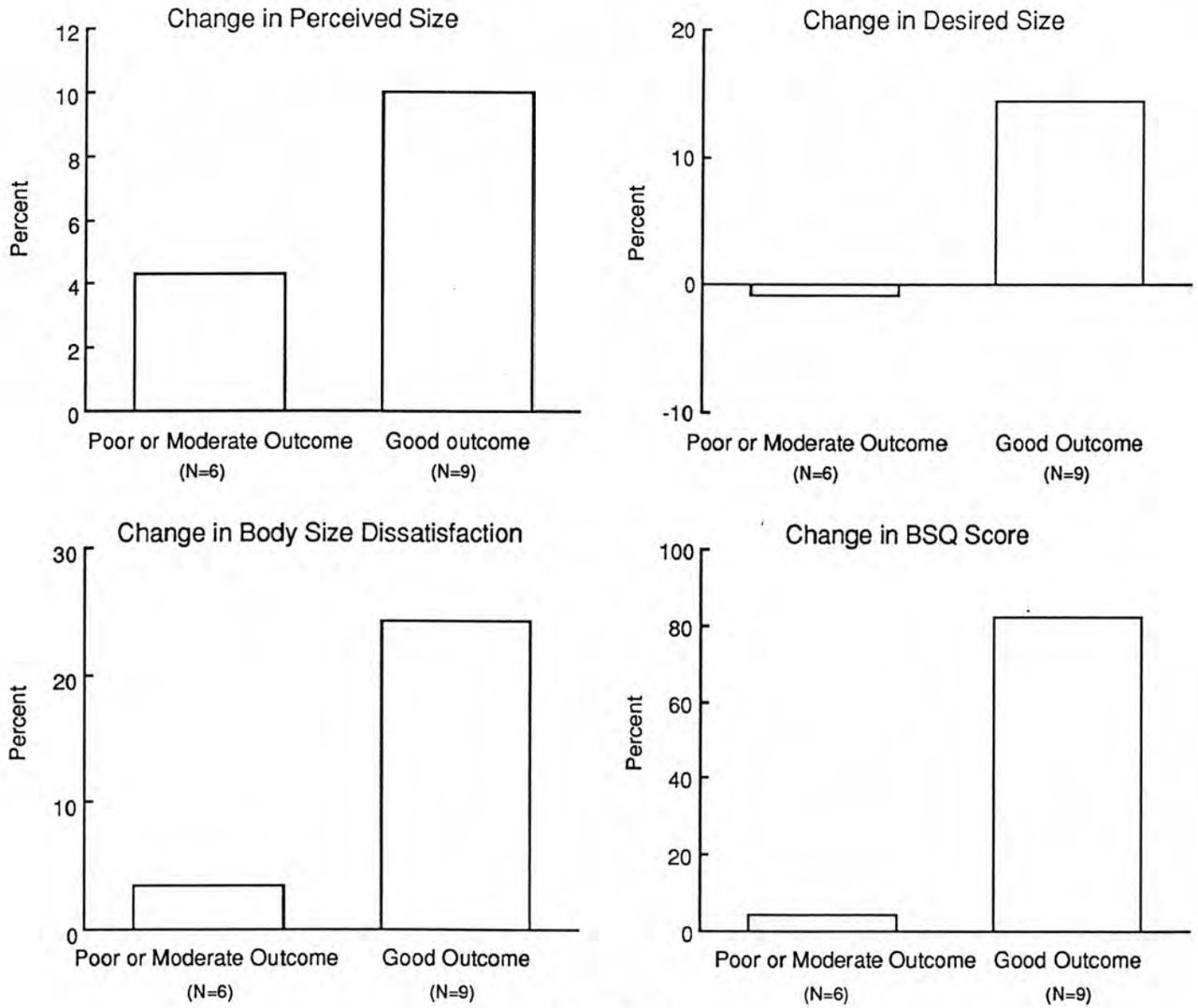


Figure 5.3.6

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

Mean Ranks

Change	Poor or Moderate Recovery (N=6)	Good Recovery (N=9)	Z	P
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.