

SELECTIVE MEMORY BIAS IN WOMEN WITH BULIMIA NERVOSA AND WOMEN WITH DEPRESSION

Jenny Hunt

St Andrew's Hospital, Northampton, U.K.

Myra Cooper

Warneford Hospital, Oxford, U.K.

Abstract. Memory bias for weight and shape, and for food related words, was investigated in women with bulimia nervosa (12), women with depression (12) and female nonclinical controls (18). The aim of this study was to investigate whether women with bulimia nervosa demonstrate memory biases congruent with their primary concerns. Participants listened to target and control words. They performed a self-referent encoding task and recall memory was assessed. The results indicated that women with bulimia nervosa demonstrated a bias to recall positive and negative weight and shape related words compared to emotional words, but not compared to neutral nouns and body words. Memory biases for food related words were not found to be specific to women with bulimia nervosa, but were also found in women with depression. Contrary to previous research the recall bias for food related words was related to levels of hunger, in both groups. The findings provide partial support for memory biases for weight and shape, but not food related information in bulimia nervosa. These findings and their implications for existing research on information processing in eating disorders are discussed.

Keywords: Memory, primary concerns, bulimia nervosa, depression.

Introduction

Clinical observations that individuals with bulimia nervosa hold extreme beliefs about weight and shape, by which they evaluate their self-worth, have led to the development of cognitive models of bulimia nervosa (e.g. Fairburn, Z. Cooper, & P. Cooper, 1986; Vitousek & Hollon, 1990). Fairburn and colleagues propose that these beliefs or attitudes to weight and shape are of primary importance in the disorder, while attitudes to food and eating, which are commonly observed, are secondary. Vitousek and Hollon (1990) further suggest that these beliefs, particularly those organized around issues of weight and shape, and its implications for the self, have schematic qualities. Once activated, they guide the cognitive processes of attention, memory and interpretation, all of which operate to favour schema congruent information

Request for reprints to Jenny Hunt, Clinical Psychologist, St Andrew's Hospital, Billing Road, Northampton NN1 5DG, U.K.

© 2001 British Association for Behavioural and Cognitive Psychotherapies

(Blackburn & Davidson, 1990). Such information processing biases serve to maintain the schemata and may explain the persistence of symptoms in bulimia nervosa.

The most extensively researched aspect of information processing in eating disordered patients is attentional allocation (e.g., M. Cooper & Todd, 1997; Formea & Burns, 1996; and M. Cooper, Anastasiades, & Fairburn, 1992). Overall, this research suggests that women with bulimia nervosa demonstrate attentional biases towards information congruent with their concerns about weight and shape, food and eating related information.

However, to date few studies have investigated other aspects of information processing in women with bulimia nervosa; for example, only two studies were found that have investigated memory bias in this group. In one study (King, Polivy, & Herman, 1991) eating disordered women were compared with restrained and unrestrained eaters, and with obese women, on recall for weight, food and appearance related information. The eating disordered participants demonstrated enhanced recall for weight, and for food related information. However, only six eating disordered participants were included in the study, most of whom had a diagnosis of anorexia nervosa. It is not clear if the bias is also found in bulimia nervosa. In addition, the study did not control for the possible effect of differences between the groups in levels of hunger.

More recently, Sebastian, Williamson & Blouin (1996) compared a mixed group of eating disordered patients, high body dysphoric women and normal controls, on recall of fat related words, neutral body words and neutral control words. The eating disordered participants demonstrated a recall bias towards fat related words when compared with neutral body and neutral control words. The high body dysphoric and normal controls did not demonstrate this bias. However, the eating disordered participants had elevated levels of depression and as M. Cooper (1997) notes all the fat words were negatively toned, it is thus not clear if the observed recall bias reflects biases specific to fat related words or a general negative bias due to depression. The study also did not examine the relative contribution of thin related words to selective recall; these may be equally as important as fat related words in bulimia nervosa (Vitousek & Hollon, 1990).

The aim of the present study was therefore to investigate selective recall of weight and shape related words, and food related words, in women with bulimia nervosa. In particular, the study sought to determine whether recall bias is specific to negatively toned emotional information in general. In order to investigate the role of depression in recall bias a depressed control group was included in the study. The relationship between hunger and recall of food related words was also investigated. Finally, an additional aim was to replicate the findings of Sebastian et al. (1996) that recall bias is specific to weight and shape related words and not to body words in general.

Method

Participants

Clinical participants. Twelve participants with a primary diagnosis of bulimia nervosa and 12 with a primary diagnosis of depression were recruited through their responsible clinician. All were female, aged 18–35 years and had a Body Mass Index (BMI: Weight kgs/Height m²) within the range 19–25 (National Research Council, 1989). All participants fulfilled DSM-IV criteria (American Psychiatric Association, 1994) for bulimia or for major

depression at the time they took part in the study. Women with depression who also had eating disorder symptoms or a history of an eating disorder were excluded from the study. Women with depression, who had been dieting for a period of 4 weeks or more were also excluded. Dieting was defined as following a standard reducing diet and/or setting rigid rules about what should be eaten (M. Cooper & Fairburn, 1992).

Nonclinical female controls. Eighteen nonclinical controls were recruited by requesting volunteers from amongst hospital employees. All were aged 18–35 years, and had a BMI within the range 19–25. Women with a diagnosis or history of an eating disorder or who had a psychiatric history were excluded. Women who had been dieting for a period of 4 weeks or more, were also excluded.

Self-report questionnaires

Eating Attitudes Test (EAT; Garner & Garfinkel, 1979), Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), Rosenberg Self Esteem Scale (RSE; Rosenberg, 1965), Mill Hill Vocabulary Scale (Mill Hill; Raven, 1965), Hunger Rating Scales (Channon, Hemsley, & de Silva, 1988). Based on the measures of Channon and colleagues a subjective rating of hunger at the time of the experiment was obtained using a 7-point Likert Scale. The amount of food that could be eaten was obtained using a 6-point Likert Scale. Time since last meal and time until the next meal was also recorded. These scales do not have established validity and reliability.

Materials

A pool of 120 stimulus words was generated. This consisted of three categories of 24 positively and negatively toned words: weight/shape words (e.g., thin, bulging), food words (e.g., salad, cakes), emotional words (e.g., happy, useless), and 24 neutral body words (e.g., knee, finger), and 24 neutral filler words (e.g., college, flower). For the weight/shape and food words, positively toned is defined in terms of thin related words and negatively toned in terms of fat related words. The weight/shape, food and body words were mostly drawn from previous published research (e.g., Sebastian et al., 1996; Huon & Brown, 1996; Markus, Hamill, & Sentis, 1987; Channon et al., 1988). The emotional words were generated through examination of self-report inventories and were randomly generated. The neutral filler words were randomly selected nouns and did not form a specific category.

All 120 words were categorized for word type and rated for emotional tone by 14 female post-graduates. Any words that were highly ambiguous for category or emotional tone were discarded. Stimulus words were matched for word frequency across word categories. In addition, within the word categories negatively valenced and positively valenced words were also matched for word frequency (Carroll, Davies, & Richman, 1971).

Procedure

Participants were seen individually. Demographic data were collected and all participants were then screened for depression and bulimia nervosa using the Structured Clinical Interview for DSM-IV (Spitzer, Williams, & Gibbons, 1996) in order to ensure patient particip-

ants met DSM-IV criteria for either disorder. The nonclinical controls were additionally interviewed about any psychiatric history, or current psychiatric treatment.

Prior to starting the cognitive task, participants were asked to complete Hunger Rating Scales (Channon et al., 1988). Participants were then presented with a practice trial of six words on audiotape to ensure they understood the instructions; they were instructed to listen to the words and to imagine a scene involving the word and themselves. The 120 experimental words were then presented in a fixed random order on audiotape at the rate of one word every 10 seconds. Following completion of the word task participants were given a distraction task, in which they were required to count backwards in three from 100 for 20 seconds. Participants were then given a blank sheet of paper and asked to write down all the words that they could remember hearing on the tape, indicating when they had finished. On completion of the experimental task participants completed the self-report questionnaires.

Results

Participant characteristics

The mean age, Body Mass Index (BMI) and number of years in full-time secondary higher education for the three groups is presented in Table 1. The data for the participant characteristics did not meet assumptions necessary for parametric statistics. Kruskal-Wallis Analysis of Variance was therefore used to assess group differences. There was no significant difference between groups in BMI. However, the groups differed significantly in age ($X^2(2) = 6.19, p < .04$), and numbers of years in education ($X^2(2) = 13.3, p < .001$). The mean scores for the self-report questionnaires are presented in Table 2.

Table 1. Demographic data for the three groups

Group	Bulimia nervosa <i>N</i> = 12	Depressed controls <i>N</i> = 12	Female controls <i>N</i> = 18
Mean age in years	23.8 (4.2)	27.6 (4.9)	26.6 (3.3)
BMI-kg/m ²	22.3 (2.3)	23.2 (2.4)	22.4 (1.6)
Mean years in education	8.9 (2.6)	8.2 (2.8)	11.9 (1.1)

Standard deviation in parentheses; Mean years in education = the mean number of years in full-time education from the age of 11 years upwards.

Table 2. Mean scores and standard deviations for each self report questionnaire

Scale	Bulimia nervosa (<i>N</i> = 12)	Depressed controls (<i>N</i> = 12)	Female controls (<i>N</i> = 18)
BDI	25.5 (8.6)	25.3 (11.2)	5.4 (3.8)
EAT	30.1 (10.5)	5.9 (4.5)	2.4 (2.0)
RSE	20.1 (3.3)	18.6 (5.3)	31.3 (5.0)
Mill Hill	27.0 (4.9)	28.3 (5.1)	30.7 (3.7)

Standard Deviation in parentheses, BDI = Beck Depression Inventory; EAT = Eating Attitudes Test; RSE = Rosenberg Self Esteem Scale, this has been scored in a positive direction such that a higher score indicates higher self esteem; Mill Hill = Mill Hill Vocabulary Scale, Synonym Section.

Table 3. Mean and standard deviation of words recalled in each category

Word type	Valence	Bulimics <i>N</i> = 12	Depressed <i>N</i> = 12	Female controls <i>N</i> = 18
Weight/shape	positive	3.7 (1.8)	1.8 (1.8)	4.1 (2.0)
	negative	3.0 (1.3)	1.9 (1.1)	4.0 (1.4)
	total	6.7 (2.4)	3.7 (2.6)	8.1 (2.9)
Emotional	positive	1.8 (1.6)	1.6 (1.4)	3.6 (1.7)
	negative	1.8 (1.3)	2.3 (1.8)	3.7 (1.8)
	total	3.6 (2.6)	3.9 (3.0)	7.3 (2.9)
Food	positive	3.4 (1.6)	2.9 (2.4)	3.8 (2.2)
	negative	3.1 (1.8)	2.3 (1.9)	3.8 (2.1)
	total	6.4 (2.5)	5.3 (3.8)	7.4 (3.8)
Body	neutral	6.8 (3.8)	7.1 (4.5)	11.1 (2.8)
Nouns	neutral	3.5 (2.4)	2.9 (2.6)	6.4 (2.9)

Standard deviation in parentheses

One-way analyses of variance with post hoc Tukey tests were used to assess group differences. A significant difference was found between groups on the EAT ($F(2,39) = 77.2$, $p < .0001$). The bulimic group scored significantly higher than the female control group and depressed group (both comparisons, $p < .05$), indicating that the bulimic group had more disturbed eating attitudes. As expected, a significant difference was found between groups in scores on the BDI ($F(2,39) = 32.8$, $p < .0001$). Post hoc tests indicated that the bulimic and depressed groups both scored significantly higher than the female controls (both comparisons, $p < .05$). A significant difference was found in scores on the RSE between the three groups ($F(2,39) = 33.9$, $p < .0001$). The female controls had significantly higher self-esteem than both the depressed and bulimic groups (both comparisons, $p < .05$). There was no significant difference between groups on the Mill Hill Vocabulary Scale ($F(2,39) = 2.7$, NS).

Analysis of selective recall measures

The selective recall data met the assumptions necessary for parametric statistics. Analyses of variance with post hoc Tukey tests were therefore used to assess group differences. The mean of each word type recalled by the three groups is presented in Table 3.

Analysis of recall for weight/shape words

Comparison with neutral words. A two-way analysis of variance [group x word type (weight/shape vs neutral nouns)] with repeated measures on the second factor was carried out. There was a main effect of word type ($F(1,39) = 14.6$, $p < .0001$), indicating that more words related to weight and shape than neutral nouns were recalled. There was also a main effect of group ($F(2,39) = 11.7$, $p < .0001$). No significant two-way group by word type interaction was found ($F(2,39) = 1.93$, NS). Post hoc tests showed that the control group recalled significantly more words overall than the depressed and bulimic groups (both comparisons, $p < .05$).

Comparison with neutral body words. A two-way analysis of variance [group x word type (weight/shape vs neutral body)] with repeated measures on the second factor was carried out. There was a main effect of word type ($F(1,39) = 16.3, p < .0001$) and a main effect of group ($F(2,39) = 9.3, p < .001$). However, these main effects were modified by a significant group by word type interaction ($F(2,39) = 3.54, p < .04$). Between group analyses using post hoc tests indicated that the bulimic group recalled significantly more weight/shape words than the depressed group ($p < .03$), as did the female controls ($p < .0001$), but that the bulimic group did not differ significantly from the female control group in recall for weight/shape words. Furthermore, the female control group recalled significantly more body related words than both the depressed and bulimic groups (both comparisons, $p < .05$), but there was no significant difference in recall of body words between the depressed and bulimic groups. Within group analyses using post hoc tests indicated that both the female controls and the depressed group recalled significantly more neutral body words than weight/shape words (both comparisons, $p < .05$). However, the bulimic group did not demonstrate a significant difference between recall of neutral body words and weight/shape words.

Comparison with emotional words. A two-way analysis of variance [group x word type (weight/shape vs emotional)] with repeated measures on the second factor was carried out. Again, there was a main effect of group ($F(2,39) = 8.8, p < .001$), and a main effect of word type ($F(1,39) = 15.1, p < .0001$). However, these main effects were modified by a two-way interaction of group by word type ($F(2,39) = 17.8, p < .0001$). Between group analyses using post hoc tests indicated that the female control group recalled significantly more weight and shape related words than the depressed group ($p < .0001$), but not the bulimic group. The female control group also recalled significantly more emotion words than both the depressed and bulimic groups (both comparisons, $p < .001$). The bulimic group recalled significantly more weight and shape related words than the depressed control group ($p < .02$).

Within group analysis using post hoc tests indicated that the bulimic group recalled more weight/shape words than emotion words ($p < .01$). However, the depressed and female control groups showed no significant difference in recall between weight/shape words and emotion words.

A three-way analysis of variance [group x word type (weight/shape vs emotional) x valence (positive vs negative)] with repeated measures on the second and third factors was carried out. There were no significant findings (all comparisons, $F < 1$, NS).

Analysis of recall for food words

Hunger ratings. Prior to the analysis of recall for food related words the relationship between this and hunger was assessed. Data from the hunger scales provided information on subjective ratings of hunger at the time of the experiment, how much participants thought they could eat, time since the last meal, and time until the next meal. Kruskal-Wallis Analysis of Variance found that there was no difference in hunger between the three groups ($X^2(2) = 1.09$, NS), or in amount of food that could be eaten ($X^2(2) = .871$, NS). A new variable "time" was computed, by adding time from last meal to time until next meal in order to obtain total time without food. Using one-way analysis of variance no significant difference in "time" was found between the three groups ($F(2,38) = 1.18$, NS).

Spearman rho correlation analysis of hunger ratings and number of food words recalled found that recall of food words was significantly correlated with hunger in the bulimic group ($r = .682, p < .02$), and in the depressed group ($r = .643, p < .02$), but not in the female control group. It was therefore not appropriate to use hunger ratings as a covariate, because the assumption of homogeneity of regression would not be met. Quantity of food that could be eaten was not significantly correlated with recall of food words between the three groups. Pearson correlation analysis of "time" (total time without food) with recall of food words between the three groups was also not significant.

Comparison with neutral nouns. A two-way analysis of variance [group x word type (food vs neutral nouns)] with repeated measures on the second factor was carried out. There was a main effect of word type ($F(1,39) = 15.9, p < .0001$), which showed that overall more food words were recalled than neutral nouns. There was also a main effect of group ($F(2,39) = 4.6, p < .02$). The interaction of group by word type was not significant ($F(2,39) = 1.44, NS$). Post hoc tests of the main effect of group indicated that the female controls recalled significantly more words than the depressed and bulimic groups (both comparisons, $p < .05$).

Comparison with emotional words. A second two-way analysis of variance [group x word type (food vs emotional)] with repeated measures on the second factor was carried out. There was a main effect of word type ($F(1,39) = 11.6, p < .002$), and a main effect of group ($F(2,39) = 4.2, p < .02$). The main effects were modified by a significant two way interaction of group by word type ($F(2,39) = 4.04, p < .025$). Between group post hoc tests indicated that the female controls recalled significantly more emotional words than the bulimic and depressed groups (both comparisons, $p < .01$). Within group post hoc tests demonstrated that both the depressed and bulimic groups recalled significantly more food than emotional words (both comparisons, $p < .05$).

A three-way analysis of variance [group x word type (food vs emotional) x valence (positive vs negative)] with repeated measures on the second and third factors was carried out. There were no significant findings (all comparisons, $F < 1, NS$).

Discussion

Analysis of memory biases for weight/shape related words produced mixed findings. The bulimic group demonstrated enhanced recall for weight/shape related words compared to emotional words, but not compared to neutral nouns or neutral body words. However, the depressed and female control groups demonstrated enhanced recall for neutral body words, which was not demonstrated by the bulimic group. These findings provide only partial support for those of Sebastian et al. (1996), who found significantly enhanced recall for weight and shape words compared to neutral nouns and body words in women with eating disorders. The differences in the findings may be accounted for by differences in the stimuli used, and Sebastian et al. (1996) also used a mixed group of eating disordered women.

The finding that women with bulimia nervosa demonstrate enhanced recall for weight/shape words compared to emotional words suggests that they do not have a general bias towards all emotionally toned information. More specifically, the fact that the bulimic group did not demonstrate enhanced recall only for negatively valenced weight and shape related words suggests that they have a bias to recall both negative and positive weight and shape

related words equally. Cognitive processing in women with bulimia nervosa may be specific to weight and shape related words, and not similar to the memory bias towards negatively toned information associated with depression, as was suggested by Sebastian et al. (1996).

According to the cognitive model of Williams, Watts, MacLeod and Mathews (1997) memory for schema congruent information reflects a process of elaboration, in which associative links between representations in memory are strengthened. Enhanced recall for weight and shape related words is therefore consistent with the proposition of Fairburn et al. (1986) and Vitousek and Hollon (1990) that weight and shape related schemata, containing implications for the self, are key structures in the psychopathology of bulimia nervosa. The finding that bulimic women demonstrate recall biases towards positive weight and shape related words suggests that positive information about weight and shape as well as negative information is more elaborately encoded and readily retrieved, and may also therefore be important in the maintenance of bulimia nervosa. Alternatively, it may be argued that memory biases for weight and shape related words are partially due to more exposure to this type of information, in women with bulimia. However, these findings are consistent with research indicating that women with bulimia demonstrate greater concern with weight and shape related information, compared to non-symptomatic dieters (M. Cooper & Fairburn, 1992).

The hypothesis that women with bulimia nervosa would demonstrate a bias to recall food related words, and that this bias would not be accounted for by hunger, was not supported. Although analysis of the data suggested that the bulimic group recalled significantly more food related words than the female control groups, this finding was not specific to the bulimic group; the depressed control group also demonstrated a significant bias to recall food related words. In addition, in both groups recall of food related words was correlated with levels of hunger. No difference was found between or within the three groups in recall of negative (fat related) food words and positive (thin related) food words in women with bulimia nervosa.

Observations that hunger was correlated with recall of food related words in the bulimic and depressed groups suggests that enhanced recall for food related information may be a state dependent processing bias. However, it was not possible to determine from the study the relative contribution of hunger and possible schema driven memory biases for food related words. The finding that recall biases for food related words was also demonstrated in women with depression supports the suggestion that concerns with food may be secondary to concerns about weight and shape in bulimia nervosa, as proposed by Fairburn et al. (1986). However, this is not to say that food and eating related attitudes are not important in bulimia nervosa. According to M. Cooper, Todd and Wells (1998), eating attitudes and behaviour may be important in the maintenance of weight and shape related schemata and may represent types of schema compensation.

Previous research has demonstrated that women with bulimia nervosa demonstrate attentional biases towards food related information (e.g., M. Cooper & Todd, 1997). Such research suggests that information processing of food related stimuli may be important in the maintenance of bulimia nervosa. However, to date, this research has not accounted for levels of hunger at the time of testing. One study (on anorexia nervosa) that did account for levels of hunger is that of Channon and colleagues (Channon et al., 1988). Contrary to the findings of the current study, Channon and colleagues found that attentional biases towards food related words were not due to hunger. These results, combined with the results pre-

sented here, raise the intriguing possibility that different processing biases may be demonstrated for different types or categories of stimuli in women with different eating disorders. According to the model of Williams et al. (1997), attention is associated with the automatic process of integration, which facilitates the detection of threat. Attentional biases towards food related words may therefore reflect integration processes of the detection of threat. However, it remains to be established whether or not attentional biases to food related stimuli, like recall biases, in women with bulimia nervosa are not simply due to levels of hunger. It also remains to be established whether or not attentional biases towards food related stimuli are found in other relevant psychiatric control groups including, as in the current study, young women with a diagnosis of depression.

In summary, the findings of the current research are consistent with the suggestion that bulimia nervosa is characterized by schemata concerned with weight and shape and its implications for the self. However, due to the small sample sizes the findings of this study have limited generalizability and reliability. It is therefore important that these findings are replicated by further research. Furthermore, the overall design would be enhanced by the inclusion of an anorexic group in order to establish whether the memory bias for weight/shape related words but not food related words is specific to women with bulimia nervosa. As suggested by Vitousek (1996), differences between eating disorder subtypes may be represented at the level of cognitive schemata. Overall, the findings of this study provide support for cognitive approaches to bulimia nervosa, which emphasize attitudes to weight and shape. Furthermore, the findings are consistent with outcome research. Fairburn, Peveler, Jones, Hope and Doll (1993) found that at post-treatment, the likelihood of relapse was associated with residual degree of attitudinal disturbance concerning weight and shape and its implications for the self.

References

- AMERICAN PSYCHIATRIC ASSOCIATION (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- BECK, A., WARD, C., MENDELSON, M., MOCK, J., & ERBAUGH, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry*, *4*, 561–571.
- BLACKBURN, I., & DAVIDSON, K. (1990). *Cognitive therapy for depression and anxiety*. Oxford: Blackwell.
- CARROLL, J., DAVIES, P., & RICHMAN, B. (1971). *Word frequency book*. New York: American Heritage Publishing Company.
- CHANNON, S., HEMSLEY, D., & DE SILVA, P. (1998). Selective processing of food words in anorexia nervosa. *British Journal of Clinical Psychology*, *27*, 259–260.
- COOPER, M. (1997). Cognitive theory in anorexia nervosa and bulimia nervosa: A review. *Behavioural and Cognitive Psychotherapy*, *25*, 113–147.
- COOPER, M., ANASTASIADIS, P., & FAIRBURN, C. (1992). Selective processing of eating-shape-, and weight-related words in persons with bulimia nervosa. *Journal of Abnormal Psychology*, *101*, 352–355.
- COOPER, M., & FAIRBURN, C. G. (1992). Thoughts about eating, weight and shape in anorexia nervosa and bulimia nervosa. *Behaviour Research and Therapy*, *30*, 501–511.
- COOPER, M., & TODD, G. (1997). Selective processing of three types of stimuli in eating disorders. *British Journal of Clinical Psychology*, *36*, 279–281.
- COOPER, M., TODD, G., & WELLS, A. (1998). Content, origins and consequences of dysfunctional beliefs in anorexia nervosa and bulimia nervosa. *Cognitive Psychotherapy*, *12*, 213–230.

- FAIRBURN, C. G., COOPER, Z., & COOPER, P. J. (1986). The clinical features and maintenance of bulimia nervosa. In K. Brownell & J. Forety (Eds.), *Physiology, psychology and treatment of the eating disorders*. New York: Basic Books.
- FAIRBURN, C. G., PEVELER, R., JONES, R., HOPE, R., & DOLL, H. (1993). Predictors of 12-month outcome in bulimia nervosa and the influence of attitudes to shape and weight. *Journal of Consulting and Clinical Psychology, 61*, 696–698.
- FORMEA, G., & BURNS, L. (1996). Selective processing of food, weight and body-shape words in nonpatient women with bulimia nervosa: Interference on the stroop task. *Journal of Psychopathology and Behavioural Assessment, 18*, 105–118.
- GARNER, D., & GARFINKEL, P. (1979). The eating attitudes test: An index of the symptoms of anorexia nervosa. *Psychological Medicine, 9*, 273–279.
- HUON, G., & BROWN, L. (1996). Task dependence in colour naming latency among dieters. *International Journal of Eating Disorders, 19*, 405–410.
- KING, G., POLIVY, J., & HERMAN, P. (1991). Cognitive aspects of dietary restraint: Effects on person memory. *International Journal of Eating Disorders, 10*, 313–321.
- MARKUS, H., HAMILL, R., & SENTIS, K. (1987). Thinking fat: Self schemata for body weight and the processing of weight relevant information. *Journal of Applied Social Psychology, 17*, 50–72.
- NATIONAL RESEARCH COUNCIL (1989). *Diet and health: Implications for reducing chronic disease risk*. Washington, DC: National Academy Press.
- RAVEN, J. (1965). *Guide to using the Mill Hill Vocabulary Scale with the Progressive Matrices Scale*. London: H. K. Lewis.
- ROSENBERG, M. (1965). *Society and the adolescent self image*. Princeton, NJ: Princeton University Press.
- SEBASTIAN, S., WILLIAMSON, D., & BLOUIN, D. (1996). Memory bias for fatness stimuli in the eating disorders. *Cognitive Therapy and Research, 20*, 275–286.
- SPITZER, R., WILLIAMS, J., & GIBBONS, M. (1996). *Instructional manual for the structured clinical interview for DSM-IV*. New York: New York State Psychiatric Institute.
- VITOUSEK, K. (1996). The current status of cognitive-behavioural models of anorexia nervosa and bulimia nervosa. In P. Salkovskis (Ed.), *Frontiers of cognitive psychology*. New York: Guilford Press.
- VITOUSEK, K., & HOLLON, S. (1990). The investigation of schematic content and processing in eating disorders. *Cognitive Therapy and Research, 14*, 191–214.
- WILLIAMS, J., WATTS, F., MACLEOD, C., & MATHEWS, A. (1997). *Cognitive psychology and emotional disorders*. Chichester: Wiley.