

Identity Impairment and the Eating Disorders: Content and Organization of the Self-Concept in Women with Anorexia Nervosa and Bulimia Nervosa

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Objective: The cognitive model of the self-concept was used to test the theoretical proposition that disturbances in overall identity development are a core vulnerability that lead to formation of a fat body weight self-definition and eating disorder symptomatology.

Method: Structural properties of the self-concept, availability in memory of a fat body weight self-schema, and eating disordered attitudes and behaviours were measured in women with anorexia nervosa (AN) ($n = 26$), bulimia nervosa (BN) ($n = 53$) and controls ($n = 32$).

Results: Women with (AN) and (BN) had fewer positive and more negative and highly interrelated self-schemas compared to controls, and women with BN showed information processing evidence of a fat self-schema available in memory. These self-concept properties predicted eating disordered attitudes and behaviour.

Discussion: Disturbances in the overall collection of identities—an impoverished self—is an important contributor to eating disorder symptomatology. The development of new positive selves may be an important factor in recovery. Copyright © 2006 John Wiley & Sons, Ltd and Eating Disorders Association.

Keywords: self-schemas; impoverished self; identity disturbances and eating disorders

INTRODUCTION

Dating from early psychodynamic theories, the eating disorders of anorexia nervosa (AN) and

bulimia nervosa (BN) have been characterised as disorders of the self. Consistent with this view, a large collection of studies have investigated the association between dimensions of the self-concept including global self-esteem, body size estimation disturbances, attitudes toward body image and eating disorder symptomatology (see Cash & Deagle, 1997 for review). Despite the longstanding focus on the self-concept in the aetiology of the eating disorders, significantly fewer studies have addressed the long held theoretical proposition that disturbances in overall identity development and the total array of beliefs about the self are a *core vulnerability*

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Contract/grant sponsor: National Institute of Nursing Research; contract/grant number: NIH, R29 NR03457.

contributing to formation and persistence of the disorders. The primary purpose of this study is to investigate the notion of impaired identity in women with AN and BN using the cognitive model of the self-concept and to characterise organisational properties of the self-concept that are associated with the pathological eating- and weight-related attitudes and behaviours in these populations.

IDENTITY DISTURBANCES AND THE EATING DISORDERS

The idea that the eating disorders stem from identity impairments is firmly grounded in the theoretical literature. Bruch (1982) argued that AN is caused by impairments in overall identity development, and the failure to establish multiple and diverse domains of self-definition. Highly controlling and perfectionistic parenting was posited to limit opportunities for autonomous functioning and interfere with the development of a clear and elaborated sense of one's self. Bruch (1981) argued that the adolescent turns to body weight, a highly salient, personally controllable and culturally valued domain, as a viable source of self-definition to compensate for the lack of a clear identity and the associated feelings of powerlessness. She suggested that the dissatisfaction and preoccupation with body image that characterise the eating disorders reflect a maladaptive 'search for selfhood and a self-respecting identity' (Bruch, 1979, p. 255).

Since Bruch's original theoretical speculations, others have similarly suggested that the failure to develop a diverse and stable set of identities is fundamental to the formation of the eating disorders. Strober (1991) posits that a genetically based personality style of high stimulus-avoidance, low novelty seeking and high reward dependence inhibits exploratory activities necessary for normal self-concept development, while others attribute disturbances in the self-concept to parenting problems (Goodsitt, 1997; Sands, 1991). Still others link the eating disorders to cultural pressures that interfere with the development of a rich set of identities and necessitate reliance on the 'feminine ideal' as a way to cope with the absence of an authentic self (Malson, 1999; Piran, 2001).

Despite the compelling arguments that disturbances in identity development are an important factor in the aetiology of the eating disorders, several problems have limited the effectiveness of these theories as guides for research and practice. First, the eating disorder theories have not been based on a

theoretical model of the self and generally have failed to provide clear and measurable definitions of the self-related constructs. While terms such as self, selfhood, self-concept and identity are addressed in the theories, it is unclear what is precisely meant by the terms. A second problem is that because the self-related terms are not adequately defined, the precise nature of the self-disturbance is not clear. Implicit in all the theories is the notion that few positive well-developed and stable self-representations that reflect social and personal identities are articulated in memory. Others have suggested that women with an eating disorder develop an elaborated set of negative identities as a function of their high reliance on environmental feedback to evaluate the self (Vitousek & Ewald, 1993). Despite general consensus within eating disorder theoretical literature, the specific nature of the self-concept and identity impairments that characterise the disorders have not been systematically addressed.

In this study, we used the cognitive model of the self-concept as the framework for conceptualising impairments in identity development. *Identity* is conceptualised as a global construct that refers both to the process of building a self-definition as well as to products of this process including knowledge about the self-related to personal attributes and social roles (Westen & Heim, 2003). In this model, the *self-concept* is more narrowly defined as the underlying cognitive-affective structures that are the outcome of the process of identity development and that, once elaborated in memory, give rise to a sense of self-certainty, sameness and continuity over time (Baumgardner, 1990; Campbell, 1990; Campbell et al., 1996).

THE COGNITIVE MODEL OF THE SELF-CONCEPT: AN OVERVIEW

Within the cognitive model, the self-concept is defined as a set of knowledge structures about the self. Each knowledge structure is itself an organisation of knowledge that reflects a domain of emotional and behavioural commitment. These individual organisations of knowledge, sometimes referred to as self-schemas, are the cognitive products of the person's interaction with the social world. In turn, the self-schemas are functional structures that shape the individual's social interactions. A person with a self-schema in a content area (i.e. schematic) will selectively attend to stimuli relevant to the self-definition, process relevant stimuli more

quickly and with more confidence, infer more from vague stimuli, demonstrate greater recall of schema-consistent stimuli and be more resistant to inconsistent stimuli compared to persons with no self-schema in the domain (i.e. aschematic) (Markus, 1977; Markus, Smith, & Moreland, 1985).

Valence of the Self-Representations

In addition to information processing consequences, self-schemas also function to motivate and regulate goal-directed behaviour in the content domain. However, studies suggest that the behavioural regulatory consequences of positively and negatively valenced self-schemas differ in important ways. Persons with a positive self-schema in a behavioural domain demonstrate higher levels of commitment and persistence in the domain, articulate more fully developed plans and strategies for reliable behavioural performance, experience more positive affect while engaged in the domain, and are more likely to follow through on their behavioural intentions than those with equal level of intention but no related self-schema (Cross & Markus, 1994; Estabrooks & Courneya, 1997; Kendzierski, 1988; Kendzierski & Whitaker, 1997). In contrast, negatively valenced self-schemas are associated with anxiety, behavioural inhibition, low levels of involvement in the domain and contextually dependent evaluations of the self (Andersen & Cyranowski, 1994; Cyranowski & Andersen, 1998; Lips, 1995; Markus, Hamill, & Sentis, 1987).

Interrelatedness of the Self-Representations

Impairments in identity development may also be reflected in the way these knowledge structures are organised in memory. Repeated activation of subsets of knowledge units lead to their functioning as interrelated clusters (Goldstone, 1996; Linville, 1987; Niedenthal & Beike, 1997; Nowalk, Vallacher, Tesser, & Borkowski, 2000). Highly interrelated clusters of knowledge derive their meaning from each other, and, therefore, function as a single unit. An individual with a highly interrelated collection of self-schemas may be considered to have a less fully developed identity since the self-concept will function and be experienced in a more unified, less differentiated or less complex way than an individual who has many unrelated, distinctly different self-schemas.

When considered together, these studies suggest that a woman with a self-concept comprised of a *highly interrelated* collection of *few positive* and *many*

negative self-schemas, will both lack the diverse array of interests, commitments, strategies and positive affects necessary to facilitate active and meaningful goal directed behaviours in a diverse array of domains, and, simultaneously, will be more likely to experience negative affects, behavioural avoidance and inhibitions stemming from the negative self-views. Together these structural properties of the self may comprise the cognitive vulnerability that contributes to the focus on body weight as a core source of self-definition.

BODY IMAGE DISTURBANCES AS A PROXIMAL CAUSE OF THE EATING DISORDERS

Recent conceptualisations of body image construct suggest that self-related size and shape information is stored in memory both as a pictorial representation and as an abstract word-based representation (Smeets, 1997). To date, a major approach to measurement of body image disturbances in women with eating disorders has applied body size estimation techniques that access the pictorial self-representation (Smeets & Panhuysen, 1995). In contrast, Markus has focused the body weight self-conception as a semantic-based self-schema and used information processing indicators to examine individual differences in the availability of a 'fat' self-representation (Markus et al., 1987). These investigators showed that the subjects (overweight young adult women) who indicated that being overweight was an important part of their self-definition (i.e. overweight schematics) rated more overweight adjectives as self-descriptive (i.e. 'me' vs. 'not me' judgments) and were faster to make 'me' judgments, and slower to make 'not me' judgments of overweight adjectives than those with no self-schema in the domain (i.e. the aschematics). Overweight schematics were also more likely to judge silhouettes of overweight women as self-descriptive and were faster to make those judgments than aschematic subjects, which provides evidence of convergent validity between the semantic and the body size estimation measures of the body weight self-representation.

The semantic-based approach to studying the body weight self-representation has an important advantage over the body-size estimation techniques: the information processing indicators used to measure semantic-based self-representations are implicit. Therefore, these indicators are less prone to the effects of experimenter expectancies and other

motivational factors that compromise the validity of the explicit body size estimates.

In this study, we focus on the body weight self-representation as a semantically-based structure. Then we test the hypothesis that women with AN or BN will have a 'fat' self-schema available in memory by using information processing indicators which include adjective endorsement rates and response latency scores. Furthermore, we hypothesize that a self-concept comprised of few positive self-schemas, many negative self-schemas and high interrelatedness will predict the availability of a fat self-schema in memory which will, in turn, predict eating disordered attitudes and behaviours.

METHOD

Participants

Participants were 26 women with diagnosed AN, 53 women with diagnosed BN and 32 women with no history of a diagnosable mental disorder, including AN or BN, who served as controls. Of the 26 women in the AN group, 12 women met full criteria for AN and 14 women met subthreshold level criteria for the disorder (i.e. met the attitudinal criteria and either the low body weight criterion or the amenorrhoea criterion). Of the 53 women in the BN group, 29 met full criteria for BN and 24 women met subthreshold level criteria for the disorder (i.e. binge-purging cycles did not meet either the intensity or duration criterion, or they engaged in compensatory behaviours at threshold levels in response to the ingestion of small to normal quantities of food).

Eating disordered participants were recruited from local treatment programs, private psychotherapists and by community-based advertisements. Women diagnosed with any lifetime history of schizophrenia, manic-depressive illness or undif-

ferentiated forms of psychosis were excluded. Participants for the control group were recruited through community-based advertising. The Structured Clinical Interview (SCID) (Spitzer, Williams, Gibbon, & First, 1992) was used to establish the eating disorder diagnosis and the Structured Clinical Interview for Nonpatients (SCID-NP) was used to establish negative lifetime history for mental disorders for the Controls. The SCID was also used to establish the presence or absence of a major depressive disorder (MDD) in order to enable statistical control of this frequently co-occurring disorder. An experienced clinician who was trained in the administration of the SCID completed all interviews. Interrater reliability of the diagnostic category, established by having 10% of the audiotape interviews coded independently by a psychologist considered expert in the administration of the SCID, was high ($\kappa = 0.90$).

All participants were medication free (except for birth control pills) for a period of at least 2 weeks at the time of data collection. As shown in Table 1, no differences were found between the eating disordered participants and controls in age, race or level of education. Not surprisingly, the AN group had a significantly lower body mass index (BMI) than the other two groups $t_s > 8.2$, $p_s > 0.001$. Approximately one quarter of women in the AN and BN groups had a current major depressive disorder at threshold level, and the majority of these women had received psychotherapy either currently and/or in the past for their eating disorder.

Measures

Self-Schemas

The number of valenced self-schemas was measured using an open-ended format questionnaire and employing a methodology developed by Markus (1977) to identify self-schemas. Participants were given a stack of 52 blank index cards labelled A through ZZ and were asked to write down all of

Table 1. Sample characteristics

	AN group (<i>n</i> = 26)	BN group (<i>n</i> = 53)	Control group (<i>n</i> = 32)	
Age	21.7	22.6	22.8	$F(2, 107) < 1$
% EuroAmerican	96.2	84.6	84.4	$\chi^2 = 2.42$, $p = ns$
% with some college	80.8	78.8	96.9	$\chi^2 = 8.27$, $p = ns$
BMI	17.4	22.2	22.0	$F(2, 105) = 49.5$, $p = 0.001$
% with current major depression	23	26	—	
% with current or past history of ED treatment	92	86	—	

the attributes that are 'important to who you are'. They were asked to write one self-defining attribute on each card and encouraged to use as many or as few cards as necessary to thoroughly describe themselves. Next, they were asked to rate the self-descriptiveness of each self-generated attribute on an 11-point scale and then to rate 'the importance of the attribute to how you see yourself' also on an 11-point scale. Finally, they were asked to rate each attribute according to whether 'you view the attribute as positive, negative or neutral'. In keeping with previous work on self-schematicity (Kendzierski, 1988; Kendzierski & Sheffield, 2000; Kendzierski & Whitaker, 1997; Markus, 1977), attributes that were rated as highly self-descriptive and highly important (i.e. rated 8–11 on self-descriptiveness and importance scales) were classified as a self-schema. The number of positive (negative, neutral) self-schemas was computed by totalling the number of self-descriptors that met the criteria for a self-schema and were rated as positive (negative, neutral). The validity of the self-descriptiveness and importance ratings as a means to identify self-schemas has been demonstrated (Kendzierski & Whitaker, 1997; Markus, 1977) and test-retest reliability has been shown (Stein & Markus, 1990).

Information Processing Indicators of the Fat Self-Schema

The availability of a fat self-schema in memory was examined using trait adjective ratings (Rogers, Kuiper, & Kirker, 1977; Markus, 1977). Stimuli were 63 appearance-related adjectives used previously by Markus et al. (1987) to measure body-weight self-schemas. The fat scale consisted of 10 adjectives (pleasantly-plump, chubby, strapping, roly-poly, overweight, dumpy, obese, stout, fat, pudgy). Internal consistency based on the self-endorsements was $\alpha = 0.83$. Ten adjectives (muscular, youthful, short, fair, freckled, blue-eyed, brown-eyed, blond, bow-legged, stooped) that were not correlated with the fat scale score were used to construct control scales for the endorsement rating and response latencies.

Participants who failed to respond to at least 7 of the 10 fat words and 7 of the 10 control words within the allotted word presentation time were deleted from the latency analyses. Separate fat and control word endorsement scores that reflect the proportion of the total number of fat and control items endorsed as 'Me' were computed for each subject. Mean response latency time scores for the fat and control words were calculated for each subject separately for the 'Me' and 'Not Me' endorsements. A response

latency time score (RLT) was computed as long as one RLT was obtained for the scale.

Disordered Eating Attitudes

Three subscales from the Eating Disorder Inventory (EDI) (Garner, 1991) were used to measure disordered eating attitudes (Body Dissatisfaction, Drive for Thinness and Bulimia). Evidence to support the validity and reliability of the subscales is available (see Garner, 1991 for review). For this sample, alpha coefficients for the three scales ranged from 0.87 to 0.92.

Eating Disorder Behaviours

A health behaviour questionnaire was used to measure the frequency of engagement in the preceding month in a full range of eating disorder behaviours including fat/calorie restricting and fasting, excessive exercise (>1 hour/day), bingeing, vomiting, laxative, diuretic and diet pill use. The duration of amenorrhoea was also measured. Each behaviour was measured on a 5-point scale ranging from no involvement to daily involvement. For amenorrhoea, the 5-point scale ranged from regular cycles to 12 or more consecutive months with no menstrual period. To avoid a scale score that unequally reflected binge-purging type behaviours (5 of 8 behaviours assessed), separate means for the binge-purging-type behaviours and restrictive-type behaviours were computed, and averaged to form a disordered eating behaviours composite score. Eating disorder behavioural frequencies using this questionnaire were moderately to strongly correlated with behavioural frequencies measured with our diagnostic screening interview (laxatives $r = 0.88$, diuretics, $r = 0.84$, bingeing, $r = 0.52$ and diet pills $r = 0.51$, vomiting $r = 0.31$) providing evidence of convergent validity of the measure.

Procedure

Data were collected during four sessions. To minimise the effects of experimenter demand on the self-concept and eating disorder measures, participants were informed that the study concerned how women's thoughts and feelings about themselves affect their health behaviours. During Session 1, participants completed the SCID, EDI and health behaviour questionnaires. At the end of the session, height and weight were measured.

During Session 2, the information processing measures of the body-weight self-schema were completed first. The adjectives were presented on a Power Macintosh computer which recorded participants' Me/Not Me endorsements and RLT. Each

adjective appeared individually at the centre of the monitor screen for a maximum of 2000 milliseconds. A 2000 milliseconds interval was interpolated between the subject's response and presentation of the next adjective. If the 2000 milliseconds lapsed before an endorsement was made, both the endorsement and RLT variables for the item were considered missing. Participants responded by pushing one of two buttons on a computer mouse labelled 'Me' and 'Not Me'. The 'Me' button was positioned in the subject's dominant hand.

In session 3, participants completed measures not addressed here. In session 4, the self-schema measure was administered first followed by measures of mood and physical health status. Participants were paid \$115 for completing the four sessions.

Data Analysis

Analyses of variance and covariance were used to test the hypotheses that women with AN and BN differ from Controls in the structural properties of the self-concept and in the availability of a fat self-schema in memory. Path analysis was used to test the hypothesis that the number of positive and negative self-schemas, and interrelatedness predicts the availability of a fat body weight self-schema, which in turn predicts disordered eating attitudes and behaviours. An additional path analysis using square root transformations of non-normally distributed variables (positive and negative self-schemas, interrelatedness and EDI bulimia score) did not differ from the original analysis. For the clarity of interpretation, the path analysis using non-transformed variables is presented. Sobel tests were used to test whether the fat self-schema significantly

mediated the effects of the self-structure variables on eating disorder attitudes and behaviours.

RESULTS

Preliminary analyses were conducted to test for differences in BMI and all dependent variables between threshold and subthreshold participants for the AN and BN groups. Multivariate ANOVAs showed only two between group differences: (1) not surprisingly, the threshold AN group had a lower BMI ($M = 15.95$, $SD = 1.64$) than the subthreshold AN group ($M = 18.67$, $SD = 1.92$), $F(4, 21) = 14.86$, $p = 0.001$, and (2) they also had fewer positive self-schemas ($M = 8.00$ vs. 13.00), $F(4, 21) = 5.46$, $p = 0.028$. No between group differences were found for BN groups. Consequently, threshold and subthreshold participants were combined into AN and BN groups for all subsequent analyses.

Valenced Self-Schemas

The first hypothesis is that women with AN or BN will have a self-concept characterised in part by fewer positive and more negative self-schemas compared to controls. The top panel of Table 2 shows descriptive statistics for the organisational properties of the self-concept for all three groups. No differences were found between groups in the total number of self-descriptors generated. However, a between-groups repeated measures analysis of variance of the number of self-schemas classified by self-rated valence (positive, negative or neutral) revealed a significant main effect for self-schema valence, $F(2, 106) = 75.72$, $p < 0.001$, and a significant

Table 2. Descriptive statistics for organizational properties of the self-concept and criterion variables by group

	AN group ($n = 26$) Mean (SD)	BN group ($n = 51$) Mean (SD)	Control group ($n = 32$) Mean (SD)
Total self-descriptors	30.46 (10.98)	26.78 (10.13)	31.19 (11.92)
Total self-schemas	18.62 (7.54)	16.19 (7.36)	18.28 (9.62)
Positive self-schemas	10.69 (5.90) ^a	9.78 (6.36) ^a	15.00 (9.03) ^b
Negative self-schemas	5.42 (3.86) ^c	4.63 (3.97) ^c	1.34 (2.10) ^d
Neutral self-schemas	2.50 (2.66)	1.78 (1.68)	1.94 (1.63)
Interrelatedness	0.21 (0.14)	0.19 (0.10)	0.13 (0.08)
EDI body dissatisfaction	16.32 (7.34) ^e	20.30 (5.84) ^f	10.19 (7.63) ^g
EDI drive for thinness	15.80 (5.48) ^h	14.98 (5.41) ^h	4.09 (4.91) ⁱ
EDI bulimia	2.83 (4.64) ^j	9.04 (5.72) ^k	0.69 (1.64) ^l
Total ED behaviours composite score	1.30 (0.41) ^m	1.65 (0.56) ⁿ	0.61 (0.32) ^o
EDI body dissatisfaction	16.32 (7.34) ^p	20.30 (5.84) ^q	10.19 (7.63) ^r
EDI drive for thinness	15.80 (5.48) ^s	14.98 (5.41) ^s	4.09 (4.91) ^t

Note: $a < b$; $c > d$; $g < e < f$; $h > i$; $l < j < k$; $o < m < n$; $r < p < q$; $s > t$; all $ps \leq 0.04$.

group X type of valence interaction, $F(4, 106) = 8.71$, $p < 0.001$. The lack of a main effect for group indicated that the AN, BN and control groups did not differ in the overall number of descriptors rated as schematic. The main effect of valenced self-schemas revealed that, overall, participants generated more positive self-schemas than negative and neutral self-schemas. More important, however, was the two-way interaction. Planned comparisons showed that compared to the Controls, both the AN and BN groups generated significantly fewer positive self-schemas, $ts \geq 4.31$, $ps < 0.025$ and more negative self-schemas $ts \geq 3.28$, $ps \leq 0.001$. The AN and BN groups did not differ from each other in the number of positive or negative self-schemas, $ts < 1$, $ps = ns$. None of the three groups differed in the number of neutral self-schemas and, therefore, this variable was dropped from all subsequent analyses.

Interrelatedness

The hypothesis that women with AN or BN will have a higher level of interrelatedness compared to controls was examined using a oneway ANOVA. As predicted, the level of interrelatedness differed across groups $F(2, 106) = 4.02$, $p = 0.02$. As shown in Table 2, women in the AN and BN groups had higher interrelatedness compared to Controls, $ts \geq 2.33$, $ps < 0.03$. Women in the AN and BN groups did not differ from each other, $t = 1.67$, $p = 0.51$.

Fat Self-Schema

To test the hypothesis that women with AN and BN differ from controls in their susceptibility to cultural standards regarding body weight/shape and, therefore, are more likely to define themselves as fat, analyses of covariance on the adjective endorsements and response latency times were completed. To control for possible group differences in general information processing, parallel responses to 'other' words were used as a covariate in the analysis of each of the dependent variables. In addition, to control for objective differences in body weight between women in the AN group and the other two groups, BMI was also used as a covariate in these analyses.

Adjective Endorsements

In the analysis of the proportion of fat adjectives endorsed as self-descriptive (i.e. 'me' ratings), one of the covariates—BMI—was significant $F(1, 102) = 6.07$, $p < 0.02$, but the other covariate—control words endorsed as self-descriptive—was not significant, $F < 1$. As expected, the main effect for group was significant, $F(2, 102) = 7.92$, $p = 0.001$.

Pairwise comparisons showed that the BN group endorsed as self-descriptive a significantly greater proportion of the fat words (adj. $M = 33.6\%$) relative to controls (adj. $M = 12.1\%$), $p < 0.001$, but contrary to predictions, the AN group (adj. $M = 22.3\%$) did not. The AN group and BN groups did not differ from each other, $p = 0.16$.

Response Latencies for Adjective Endorsements

To determine whether the groups differed according to their efficiency in processing the body-weight adjectives, the idiographic mean response latencies to the fat adjectives were examined. Because 41% ($n = 13$) of the women in the control group did not endorse even one fat word as self-descriptive, response latencies for 'Not Me' judgments were used in the analysis. Results of previous studies have shown that individuals with a self-schema in a given domain make 'Not Me' judgments of schema-consistent adjectives *more slowly* than those with no self-schema in the domain (Markus, 1977; Markus et al., 1987).

RLT for the 'Not Me' judgments of the control words was a significant covariate, $F(1, 101) = 58.63$, $p < 0.001$, but BMI was not, $F < 1$. A significant main effect for group was also found, $F(2, 101) = 10.23$, $p < 0.001$. Pairwise comparisons showed that the BN group was significantly slower to make 'Not Me' judgments for the fat adjectives (adj. $M = 1.16$ seconds) compared to both controls (adj. $M = 1.00$ seconds) and those in the AN group (adj. $M = 1.03$ seconds), $ps < 0.01$. Contrary to predictions, the AN group did not differ from controls in the RLT for the 'Not Me' judgments of the fat adjectives.

Self-Concept as a Predictor of Disordered Eating Attitudes and Behaviours

Path analyses were completed to test the hypothesis that the number of positive and negative self-schemas, and interrelatedness predict the availability of a fat body weight self-schema which, in turn, predicts disordered eating attitudes and behaviours. A composite measure of the information processing indicators of a fat self-schema was constructed to reduce the multicollinearity between the adjective endorsement and RLT variables ($r = 0.53$). The z scores for the proportion of fat words judged as 'Me' and the RLT for the 'Not Me' judgments on the fat words were summed to form a composite fat self-schema score. In the initial regression analysis, the number of positive and negative self-schemas, and interrelatedness were used to predict

Table 3. Bivariate correlations between self-schema variables and criterion variables for the entire sample

	1	2	3	4	5	6	7	8
1 # Positive self-schemas	—							
2 # Negative self-schemas	-0.22	—						
3 Interrelatedness	-0.03	0.01	—					
4 Fat self-schema score	-0.40*	0.20	0.00	—				
5 EDI body dissatisfaction	-0.39*	0.17	0.14	0.56*	—			
6 EDI drive for thinness	-0.30	0.34*	0.21	0.41*	0.69*	—		
7 EDI bulimia	-0.26	0.22	0.09	0.42*	0.46*	0.69*	—	
8 Total ED behaviours composite score	-0.15	0.14	0.23	0.35*	0.50*	0.66*	0.58*	—

Note: *significant ($p \leq 0.0018$) using Bonferroni correction for multiple tests.

the fat self-schema score. To control for the effect of differences in BMI, this variable was also included in the initial step. In the second regression analysis, the four self-concept variables and BMI were used to predict the criterion variables (body dissatisfaction, drive for thinness and bulimia subscales of the EDI), and the eating disordered behaviours composite score. Group means and standard deviations for the criterion variables are presented in the bottom panel of Table 2, and correlations between self-schema variables and the criterion variables are presented in Table 3.

Results of the path analyses¹ are shown in Figure 1. No significant interactions were found. The number of positive self-schemas negatively predicted the fat self-schema score while the number of negative self-schemas and BMI positively predicted the fat self-schema score. While interrelatedness did not predict the fat self-schema score as predicted, it did directly and positively predict drive for thinness and disordered eating behaviour. The unstandardised coefficients suggest that a woman with a fully interrelated self-concept (i.e. an interrelatedness score of 1.00), would have a drive for thinness score that is 11 points (92%) higher than the overall mean of 11.94, and an eating disorder behaviour composite score that is 1.2 points (94%) higher than the overall mean of 1.27. Together with BMI, the three self-concept variables (positive self-schemas, negative self-schemas and interrelatedness) accounted

for between 21% and 39% of the variance in the disordered eating attitudes and behaviours variables.

In all four models, the array of positive and negative self-schemas indirectly influenced the attitudinal and behavioural criterion variables through the availability of a fat self-schema. The unstandardised coefficients suggest that each positive self-schema reduces the fat self-schema score by 200% and each negative self-schema increases the fat self-schema score by 200%. Sobel tests on the unstandardised coefficients for the entire sample revealed that the fat self-schema significantly mediated the effects of both positive and negative self-schemas on eating disorder attitudes and behaviours ($Z_s > 1.96$, $ps < 0.05$). In addition to indirect effects, the number of positive self-schemas also directly and negatively affected body dissatisfaction so that persons with fewer positive self-schemas were more likely to report high body dissatisfaction.

DISCUSSION

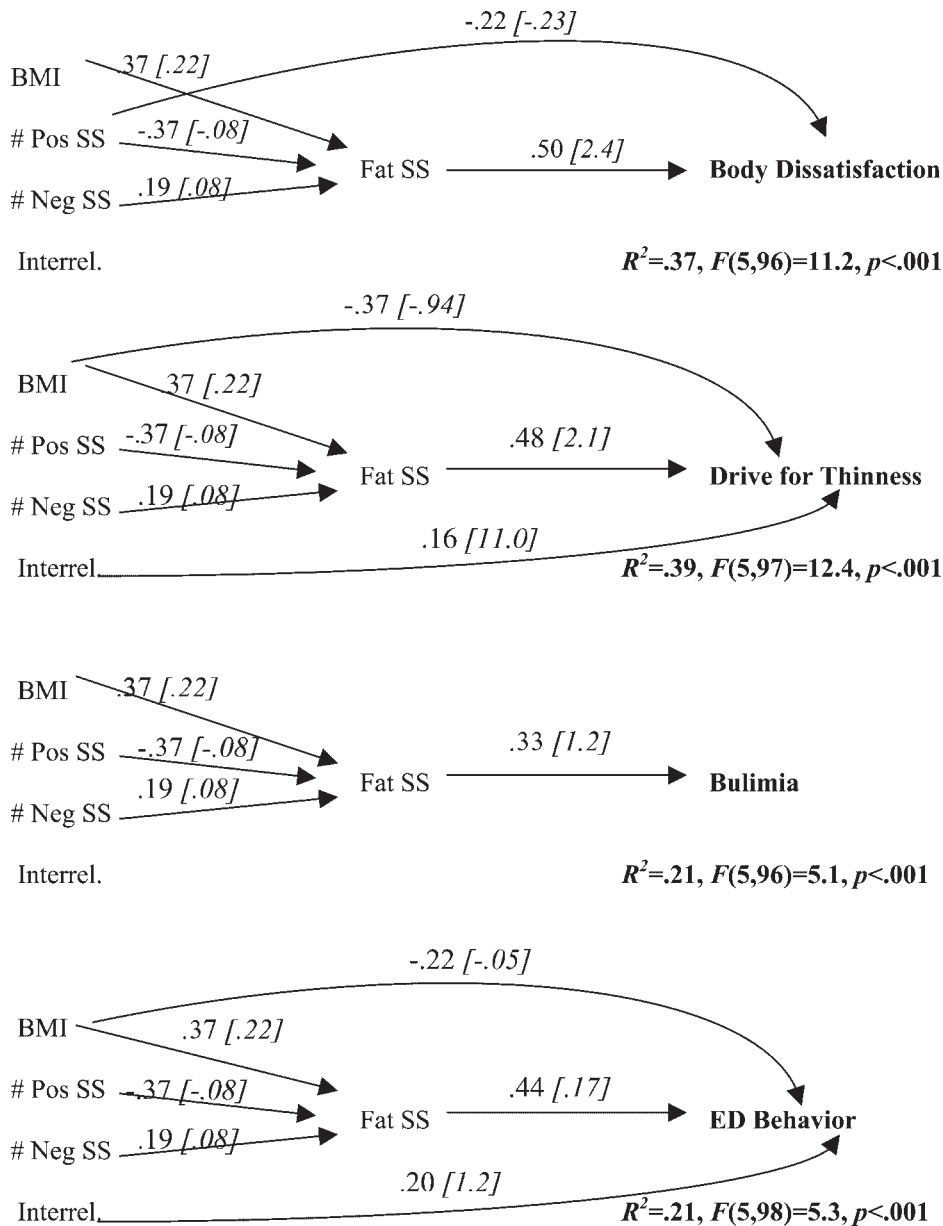
Drawing on the theoretical work of Bruch (1979) and on the more contemporary work on the self in eating disorders, we predicted that (1) overall identity impairments are associated with the development of a distorted body weight self-conception and the attitudinal and behavioural symptomatology that characterise AN and BN, (2) women with AN and BN would have fewer positive and more negative self-schemas available in memory and higher interrelatedness among their self-conceptions compared to controls; and (3) these organisational properties of the self-concept would function as a cognitive vulnerability contributing to the development of a fat body weight self-definition and eating disordered attitudes and behaviours. Results with this clinical sample of eating disordered women generally support the research hypotheses and provide evidence to suggest that basic identity impairments

¹To rule out the possibility that the effects of the self-structure variables on eating disorder attitudes and behaviours are confounded by major depressive disorder, additional path analyses that included a dummy variable for MDD (0 = no current MDD, 1 = current MDD) were also completed. The explained variance increased slightly, but the models remained essentially unchanged. MDD was a significant predictor of disordered eating attitudes and behaviours, both directly and indirectly through the fat self-schema, but the self-structure variables remained significant predictors in all four models as well.

may be a core vulnerability associated with these disorders.

As predicted, women with AN and BN differed from controls in characteristics of the total array of cognitions that define the self. Women in the AN and BN groups generated fewer positive attributes

that were rated as highly descriptive and important than controls suggesting that they have fewer positive self-schemas available in memory. In addition, women in the AN and BN groups had more negative self-schemas and higher interrelatedness among their self-conceptions compared to the control group.



Note. Only path coefficients that are significant at $p \leq .05$ are shown. [] = unstandardized coefficients.

Figure 1. Path diagrams linking self-schemas with ED attitudes and behaviours.

The second dimension of the identity impairment model focuses on the elaboration of an unrealistic body image. The prediction is that women with AN and BN would differ from controls based on the availability of a fat body weight self-definition. As predicted, women in the BN group endorsed a greater proportion of fat words as self-descriptive and were slower to make 'Not Me' judgments of fat words when compared to the control group. When considered together these results support the hypothesis that BN is associated with a highly valued conception of the self as fat that is independent of objective body weight.

The information processing results for the AN group did not converge to suggest the availability of a fat self-schema. Contrary to our prediction, no differences were found between the AN and control groups in either the pattern of fat adjective endorsements or RLT. The fact that no differences in history of psychotherapy were found between the AN and BN groups suggests that the pattern of findings observed in the AN group is not likely to be simply a function of treatment. Furthermore, evidence suggests that the failure to find the expected information processing pattern is not simply a function of the inclusion of subthreshold AN women. One plausible explanation is that while women with AN do turn to a body weight and shape self-definition to cope with the distress associated with the identity impairments, the self-conception is not an unrealistic and distorted conception of the self as fat. Additional studies are needed to verify the availability of a body weight self-schema in this population and to clarify the content of this self-structure.

Finally, results of the path analyses provide support for the overall identity impairment model. The organisational properties of the overall self-concept were predictive of the eating disordered attitudes and behaviours, and the fat self-schema score generally mediated this relationship. The availability of relatively few positive self-schemas and many negative self-schemas was associated with the availability of a fat self-schema. In turn, the fat self-schema score strongly and positively predicted body dissatisfaction, drive for thinness, bulimic attitudes and the composite measure of eating disorder behavioural symptoms. Apparently, a woman with relatively few positive self-schemas and many negative self-schemas lacks the diverse array of interests, commitments, strategies and positive affects necessary to facilitate active and meaningful goal directed behaviours, and simultaneously, experiences higher levels of negative affects and behavioural avoidance, and inhibitions stemming from the collection of

negative self-views. The additive effects of these self-concept properties contribute to the availability of a fat self-schema, which is the more proximal motivator of disordered eating attitudes and behaviours.

Despite the fact that the AN and BN groups differed from Controls in the level of interrelatedness, this dimension of the self did not predict the availability of a fat self-schema. Rather the level of interrelatedness directly and positively predicted drive for thinness and disordered eating behaviours. Although contrary to our prediction, these findings are compatible with results of a study completed by Showers showed that college women with low levels of eating disorder symptoms had a higher level of interrelatedness between their physical self-description and other negative conceptions of the self (Showers & Larson, 1999). These investigators suggested that activation of many seemingly different conceptions of the self will lead to activation of the appearance schema and consequently thoughts about appearance and weight may be more pervasive. From this point of view, the interrelatedness construct may actually reflect the extent to which the total self-concept is involved in the negative body weight/appearance domain and contributes to goals for thinness and disordered eating behaviours.

When taken together, the results of this study raise interesting questions about the appropriate focus of clinical interventions to promote recovery from the eating disorders. Prevailing forms of cognitive-behavioural treatment for the eating disorders focus heavily on modifying weight-related cognitions and eating behaviours (see Garner & Garfinkel, 1997). Women are encouraged to stop disordered eating behaviours, are taught about nutrition and consequences of weight reducing behaviours, and are taught to self-monitor through the use of written diaries. Because these interventions are largely focused on body weight and food, they may actually heighten accessibility of the fat schema—the proximal source of the disordered eating attitudes and behaviours. In addition, they fail to take into account the associated, and perhaps more basic, identity impairment. These results offer evidence to suggest that interventions designed to promote the development of new positive self-schemas may contribute to the reduction of eating disorder symptomatology. Cognitive and behavioural interventions focused on identifying and achieving personally meaningful desired possible selves (Markus & Nurius, 1986) might contribute to the elaboration of new domains of self-definition and have the added benefit of decreasing the environmentally based activation of the body weight self-definition.

LIMITATIONS

Since women already met diagnostic criteria for AN or BN, the causal direction between the formation of the eating disorder and the self-concept impairments could not be explored. The theoretical framework motivating this study poses a clear direction of causality moving from impairment in identity development to eating disorder symptomatology. An alternative explanation is that the relatively small number of positive identities, large collection of negative identities and the high level of interrelatedness are the result rather than the cause of the eating disorder symptomatology. Women with high levels of eating disorder symptoms have difficulty in maintaining normal levels of involvement in school, work and other social activities (Herzog, Norman, Rigotti, & Pepose, 1986), and, consequently, social feedback necessary to develop new sources of identity or sustain established identities might be diminished. Furthermore, as positive involvements in social activities decrease and eating disorder symptoms increase, guilt, shame and critical self-evaluations may contribute to the formation of new negative self-conceptions and a higher level of interrelatedness among existing positive and negative self-conceptions. Prospective studies that examine the unfolding of eating disorder symptoms and properties of the self-concept over time are necessary to gain greater insight into the nature of the relationship between the self-concept and the eating disorders.

Another limitation has to do with the generalisability of the findings given that the majority of the sample was Euro-American women. Although the proportion of minority women included in our sample is comparable to published prevalence rates in minority women (see Crago, Shisslak, & Estes, 1996; Pike & Walsh, 1996), the generalisability of these findings to more ethnically diverse populations of eating disordered women is unknown.

CONCLUSION

The results of this study are consistent with the view that the overall identity impairments are associated with eating disorder symptomatology. Women with AN and BN had fewer positive self-schemas, more negative self-schemas and higher interrelatedness among their self-conceptions compared to Controls, and the absence of positive selves, along with the presence of negative selves, predicted the attitudinal and behavioural symptoms associated with the

disorders. These findings highlight the importance of the total collection of identities as the context for the development of eating disorder symptomatology and raise interesting questions about the development of new positive selves as an important factor in the pathway to recovery.

ACKNOWLEDGEMENT

This research was supported by a grant from the National Institute of Nursing Research # NIH, R29 NR03457. The authors gratefully acknowledge Linda Nyquist for her assistance with data analyses and Kristen Hedger, Jennifer Sandoz and Elizabeth Brough for their assistance with data collection activities. These data were presented at the Eighth International Conference on Eating Disorders, New York, NY and at the 2nd Annual meeting of the Society for Personality and Social Psychology, San Antonio, Texas.

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