

Cognitive Dysfunction in Eating Disorders

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Recent theories have implicated disturbed cognitions in the etiology and perpetuation of eating disorders. However, the specific nature of these disturbances has received only limited empirical attention. Therefore the present study assessed subjects with a range of eating pathology on three types of cognitive dysfunction: logical errors, cognitive slippage, and conceptual complexity. Affective features were also assessed for purposes of contrast and discriminant validity. The Cognitive Error Questionnaire (Lefebvre, 1981), Thought Disorder Index (Blatt & Ritzler, 1974), Friedman's Developmental Level (Goldfried, Stricker, & Weiner, 1971), Sentence Completion Test (Loevinger & Wessler, 1970), Dysphoria Questionnaire (Johnson & Larson, 1982), and Beck Depression Inventory (Beck, 1978) were administered to 19 restrictive anorexics, 14 bulimic anorexics, 17 normal-weight bulimics, 15 subclinical eating disorders, and 17 normal control subjects. All groups were matched for age, sex, race, education, and marital status. The eating disordered groups were matched for duration of illness and treatment history, and the anorexic groups were matched on percent of ideal body weight.

Both anorexic groups manifested more logical errors than the control group; the normal-weight bulimic and subclinical groups were indistinguishable from the controls on this index. There were no significant differences among groups on cognitive slippage or conceptual complexity. In contrast, dysphoria and depression were prominent features of all four eating disordered groups. The significance and conjoint influence of cognitive and affective factors in eating pathology is discussed.

Over 20 years ago, Bruch noted the primacy of perceptual and conceptual disturbances in anorexia nervosa (Bruch, 1961, 1962). Her clinical descriptions spawned a host of studies examining body image distortions and faulty satiety

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cues (see Garfinkel & Garner, 1982, for a review). Current theories continue to emphasize cognitive factors in the etiology and perpetuation of anorexia nervosa and bulimia. However focus has now shifted to logical errors, cognitive slippage, and conceptual complexity (e.g., Fairburn, 1984; Garner, 1986; Swift & Letven, 1984). These features, although compelling from a clinical point of view, await empirical confirmation. This study examined the performance of patients with eating disorders on indices reflective of each of these forms of cognitive dysfunction.

Garner and Bemis (Garner, 1986; Garner & Bemis, 1982, 1984) have stressed the significance of logical errors in the development and maintenance of anorexia nervosa and bulimia. Akin to Beck's (1967, 1976) theory of depression, this approach to eating pathology centers on the identification and correction of cognitive distortions, such as overgeneralization, selective abstraction, catastrophizing, and personalization. Despite the clinical descriptions of these specific types of faulty thinking in eating disorders, to date there has been no empirical investigation of these phenomena.

Cognitive slippage is a term subsuming both conceptual laxity and poor reality testing. Body image distortion, an instance of impaired reality testing, has been well-documented in anorexia nervosa (Garfinkel & Garner, 1982). However, other types of cognitive slippage—*independent of body image misperception*—have been researched less rigorously. Small (1984) reviewed the psychodiagnostic literature and found evidence for both conceptual laxity and poor reality testing in anorexics' Rorschach protocols. However, Small also noted serious methodological flaws in the surveyed research.

A third cognitive feature often associated with anorexia nervosa involves more purely intellectual capabilities. Although the anorexic tends to demonstrate above-average abilities on intelligence tests (Bemis, 1978; Hamsher, Halmi, & Benton, 1981), some theorists posit that she* does not develop formal operational thinking or mature conceptual complexity (Garfinkel & Garner, 1982). One investigation, using the Loewinger Sentence Completion Test (Loewinger & Wessler, 1970), failed to confirm this speculation (Swift, Camp, Bushnell, & Bargman, 1984) but awaits replication.

In summary, logical errors, cognitive slippage, and conceptual complexity have received scant empirical attention despite their prominence in contemporary theories of anorexia nervosa and bulimia. The few investigations using patients with anorexia nervosa describe conflicting findings and seem to suffer from inadequate research designs (e.g., dependence on a single dependent variable, failure to distinguish between restricting and bulimic subtypes, and inadequate sample sizes). We are not aware of any studies exploring cognitive dysfunction in normal-weight bulimia. The present investigation thus sought to describe a set of cognitive features in subjects exhibiting a range of eating pathology, including restrictive and bulimic anorexia nervosa, normal-weight bulimia, and subclinical eating disorders (Garner, Olmsted, Polivy, & Garfinkel, 1984). Affective characteristics were also assessed for purposes of contrast and discriminant validity.

*Because the majority of patients with anorexia nervosa are females, feminine pronouns will be used throughout this paper.

METHODS

Subjects

Participants were Caucasian females, between 16 and 31 years old, who weighed no more than 110% of ideal body weight (IBW) according to the Metropolitan Life Tables and pediatric growth charts. The subjects in the anorexic and bulimic groups were recruited from the practices of local psychiatrists, psychologists, and pediatricians. Of 62 patients approached, 61 (98.4%) agreed to participate; one restrictive anorexic declined. There were 50 subjects (82.0%) who completed the study; 2 of the 21 restrictive anorexics, 5 of the 19 bulimic anorexics, and 4 of the 21 normal-weight bulimics did not return their questionnaires. A diagnosis of anorexia nervosa was made according to the Pathology of Eating Group criteria (Garrow et al., 1975). In addition, none of the restrictors had engaged in binge eating more than once a month at the time of entry into the study. Both bulimic anorexics and normal-weight bulimics met the American Psychiatric Association's criteria for bulimia (American Psychiatric Association, 1980), except for the stipulation that the bulimia not be due to anorexia nervosa.

In order to obtain subjects appropriately matched for age, education, and marital status, 33 controls were recruited simultaneously from signs posted around the University of Rochester Medical Center advertising a study entitled "Thoughts of Rochester Medical Center advertising a study entitled "Thoughts and Feelings about Body Image" and from an introductory psychology course. The Eating Attitudes Test (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982) was used to screen for undiagnosed eating pathology in these women. The 17 subjects who scored below the cut-off of 19 were subsequently included in the control group. The 16 women who scored at or above this cut-off were interviewed to determine whether they met criteria for either anorexia nervosa or bulimia. One subject was diagnosed with restrictive anorexia nervosa. The remaining 15 subjects were considered to have subclinical eating disorders.

All groups were matched for age ($X = 21.1$, $SD = 3.7$), education ($X = 13.2$, $SD = 2.0$), and marital status (87.4% single). There were no differences between the anorexic groups on their lowest or current percent of IBW ($X = 67.9$ and 70.4 , $SD = 6.5$ and 6.5 , respectively). Similarly, the normal-weight bulimic, subclinical eating disorders, and control groups did not differ on lowest or current percent of IBW ($X = 83.1$ and 91.4 , $SD = 6.4$ and 5.7 , respectively). The anorexic and bulimic groups were indistinguishable on their Eating Attitudes Test scores ($X = 40.5$, $SD = 13.9$), duration of eating problem ($X = 44.5$ months, $SD = 32.6$), or treatment history (63.6% had been hospitalized, 85.9% had received psychotherapy). Overall these subjects characteristics are consistent with past descriptions of eating disordered patients (e.g., Garner, Garfinkel & O'Shaughnessy, 1985) and suggest that the current samples are representative of the more general populations from which they were drawn.

Procedure

All subjects were introduced to the research as a study of thoughts and feelings about body image. After indicating informed consent, subjects scheduled

a 1-hour Rorschach testing session* and received a preaddressed, stamped envelope containing the paper-and-pencil instruments described below.† Subjects were instructed to complete the questionnaires within a 3-week period. When the envelope was returned and the instruments scored, each participant was contacted for a follow-up meeting during which she received feedback about her results and a nominal participation fee (\$5).

Cognitive Error Questionnaire (CEO)

Lefebvre (1981) designed this instrument to assess four common cognitive distortions: overgeneralization; selective abstraction, catastrophizing; and personalization. He demonstrated its utility in detecting cognitive distortions among depressed individuals and patients with low back pain. Internal consistency (.89-.92) and test-retest reliability (.76-.82) were excellent. The form consists of 24 vignettes of common situations which end with a statement characterized by a logical error (e.g., "I couldn't learn skiing so I doubt if I can learn to play tennis"). Using a five-point Likert scale, the subject rated how similar these statements are to how she believes she would react in the same situation. The first three distortions were represented by six vignettes each, whereas, due to a clerical error, only three vignettes were used to portray the personalization distortion. The scale was scored by totalling the rating for all vignettes portraying the same logical error; for the sake of comparability, the personalization factor was multiplied by two. These scores were then summed to yield an overall cognitive error score. The omission of three vignettes did not appear to attenuate the psychometric structure of the instrument (Cronbach's $\alpha = .93$).

Thought Disorder Index (TDI)

The Rorschach was administered following the procedures outlined by Klopfer, Ainsworth, Klopfer, and Holt (1954). Two independent raters, blind to diagnosis, assessed the protocols for cognitive slippage using Blatt and Ritzler's (1974) Thought Disorder Index. The TDI defines cognitive slippage as the degree to which boundaries between Rorschach percepts are disrupted. The most severe disturbance is reflected in the Contamination response: "Boundaries are so unstable that independent representation(s) cannot be consistently maintained, and they merge, or tend to merge, into a single distorted unit" (Blatt & Berman, 1984: p. 231-232). Less serious slippage is noted in Confabulations, in which the external perception becomes overly invested with personal associations, and Fabulized Combinations, where "spatial or temporal contiguity is taken as indicating a real relationship, even though an arbitrary and unrealistic one" (p. 232). The TDI differentially weights examples of boundary disruption on a 6-point scale of severity; for example, Contaminations receive a score of 6, whereas tendencies toward Fabulized Combinations receive a score of 1. Interjudge reliability on the TDI has been excellent ($r = .98$).

*Two of the restrictive anorexics, one subclinical, and two control subjects were unavailable for their Rorschach session.

†Additional scores were also administered and are reported in a manuscript about deficits in autonomy in anorexia nervosa (Strauss & Ryan, 1987).

Friedman Developmental Level (DL)

The Friedman Developmental Level scoring system, based on Werner's (1948) developmental theory, was used to rate cognitive complexity. It assesses Rorschach percepts along a dimension of internal organization, ranging from undifferentiated wholes and proceeding through increasing differentiation to hierarchical integration; higher scores reflect greater complexity. Goldfried, Stricker, and Weiner (1971) noted the validity of this rating against both concurrent and predictive criteria and remarked on its sensitivity to psychiatric morbidity. Ridley and Bayton (1983) reported a mean interjudge reliability of .89 and demonstrated the validity of the DL as a measure of perceptual organization. In the present study, interjudge reliability was excellent ($r = .97$).

Sentence Completion Test (SCT)

Loevinger's (1966, 1973) theory of ego development refers to the process of differentiation underlying "the framework of meaning which one subjectively imposes on experience" (Hauser, 1976; p. 930). This framework grows increasingly sophisticated in its organization through an invariant sequence of seven stages and three transitional phases; it parallels cognitive maturation. The Sentence Completion Task, designed to measure ego development, served to quantify cognitive complexity in the present study; higher scores reflect greater conceptual sophistication. From a theoretical stance, it may be the verbal analogue of the more perceptually oriented DL yet may not be as sensitive to psychiatric status (Swift et al., 1984). It comprises 36 sentence stems which the subject was asked to complete "in any way that you wish." Ten protocols were mailed to Washington University to be rated by Loevinger's research group. Two independent judges, blind to diagnosis, rated the remaining protocols according to the standard scoring instructions (Loevinger & Wessler, 1970). Reliabilities between raters ($r = .80$) and between each rater and the scoring manual ($r = .80$ and $.85$) were satisfactory and consistent with reliability coefficients reported elsewhere (Hauser, 1976).

Dysphoria Questionnaire

This instrument was based on the semantic differential questionnaire used by Johnson and Larson (1982) in their study of mood variability in bulimia. The 13 items were summed to yield an overall dysphoria score. The summary score demonstrated good internal consistency in an independent sample of undergraduate females (Cronbach's $\alpha = .94$) and was included in the present investigation to contrast affective and cognitive functioning.

Beck Depression Inventory (BDI)

The Beck Depression Inventory is a 21-item self-report inventory used for assessing depressive symptomatology (Beck, 1978). It has been used frequently in studies of eating pathology and, like the Dysphoria Questionnaire, was included in this investigation to contrast affective and cognitive features in eating disorders.

RESULTS

The four cognitive variables were entered into a multivariate analysis of variance: The Cognitive Error Questionnaire summary score, Thought Disorder Index, Developmental Level, and Loewinger Sentence Completion Test total protocol rating. Since an overall group effect was strongly indicated, $F(16,211) = 2.56, p < .001$, univariate analyses of variance were subsequently conducted on all but the TDI to detect differences among groups on specific variables; the TDI was subjected to an analysis of covariance, with number of Rorschach responses serving as the covariate (Blatt & Berman, 1984). In addition, the two affective measures, the Dysphoria Questionnaire and the BDI, were subjected to analyses of variance. Post hoc multiple pairwise comparisons were performed using the Tukey standardized range test; critical differences were determined by a present p value of .05. Table 1 depicts the results.

Relative to the normal-weight bulimics, subclinical eating disorders, and controls, the restrictive anorexics evidenced more cognitive errors overall as well as greater overgeneralization, selective abstraction, and personalization on the CEQ. The restrictive anorexics also manifested more catastrophizing than the normal-weight bulimics and the controls. The bulimic anorexics manifested more catastrophizing and cognitive errors overall than the controls. The restrictive and bulimic anorexic groups did not differ from each other on any of the CEQ variables.

The analysis of covariance detected marginal group differences on the TDI. Moreover, the two cognitive complexity variables—DL and SCT—failed to uncover any significant differences among groups. The SCT means for all groups fell within the I-3/4 to I-4 range, reflecting the transition from self-conscious to conscientious ego organization.

On both affective measures, the restrictive anorexics, bulimic anorexics, normal-weight bulimics, and subclinical eating disorders indicated greater dysphoria and depression than the control group. On the BDI, the restrictors also differed from the subclinical eating disorders.

Correlations among all measures appear in Table 2. Caution is warranted in interpreting these findings, since coefficients were calculated across different populations. None of the four cognitive variables was significantly associated with each other. However, all four were significantly related to the affective scales; greater cognitive dysfunction was associated with greater depression or dysphoria.

DISCUSSION

Understanding the complex interplay between eating disorders and cognitive dysfunction has been of increasing interest in recent years. Although varied deficits have been proposed, research has lagged. The present study sought to examine logical errors, cognitive slippage, and conceptual complexity in restrictive and bulimic anorexia nervosa, normal-weight bulimia, and subclinical eating disorders. Our results offer limited support for the notion that cognitive dysfunction is a central characteristic of eating pathology.

Logical errors do appear to be a prominent feature in anorexia nervosa, par-

Table 1. Means, standard deviations (in parentheses), and analysis of variance results.

Cognitive Error Questionnaire:	Restrictive Anorexia Nervosa (n = 19)	Bulimic Anorexia Nervosa (n = 14)	Normal Weight Bulimia (n = 17)	Subclinical (n = 15)	Control (n = 17)	F	P
Total	41.5 (16.0)	28.3 (19.5)	22.9 (12.2)	22.3 (13.8)	13.4 (9.1)	9.08	.001 ^{abc}
Overgeneralization	10.3 (4.9)	6.1 (5.7)	5.3 (3.2)	4.2 (3.5)	2.9 (3.2)	7.68	.001 ^{abc}
Catastrophizing	10.3 (4.7)	8.1 (5.8)	6.0 (3.3)	6.4 (4.0)	3.8 (2.8)	5.80	.001 ^{abc}
Selective Abstraction	11.8 (4.6)	8.4 (5.0)	5.8 (4.5)	5.1 (3.7)	4.4 (2.7)	7.15	.001 ^{abc}
Personalization	9.1 (5.1)	5.6 (5.8)	3.6 (3.1)	4.7 (4.6)	2.2 (3.3)	5.91	.001 ^{abc}
Thought Disorder Index	9.0 (9.6)	9.0 (8.2)	10.4 (9.1)	8.1 (8.8)	3.7 (5.0)	2.07	.09
Developmental Level	3.8 (0.4)	4.1 (0.4)	4.0 (0.3)	4.1 (0.3)	4.2 (0.3)	1.66	NS
Sentence Completion	6.1 (1.0)	6.6 (1.2)	6.6 (1.5)	6.3 (1.0)	6.8 (0.8)	1.05	NS
Test							
Dysphoria Questionnaire	57.0 (17.0)	63.1 (12.7)	61.1 (13.6)	51.1 (17.6)	35.9 (15.8)	9.79	.001 ^{cdg}
Beck Depression Inventory	25.0 (10.8)	24.8 (12.6)	21.5 (7.8)	11.5 (8.7)	3.6 (2.8)	17.73	.001 ^{bede}

^aRestrictors ≠ normal weight bulimics.

^bRestrictors ≠ subclinical.

^cRestrictors ≠ controls.

^dBulimic-anorexics ≠ subclinical.

^eBulimic-anorexics ≠ controls.

^fNormal weight bulimics ≠ controls.

^gSubclinical ≠ controls.

Table 2. Correlations among cognitive and affective variables.

	CEQ	TDI	DL	SCT	Dysphoria	BDI
CEQ	—					
TDI	.20	—				
DL	.02	-.10	—			
SCT	-.20	.14	.14	—		
Dysphoria	.35**	.38***	-.22*	-.04	—	
BDI	.64***	.37***	-.17	-.23*	.66***	—

* $p < .05$.** $p < .01$.*** $p < .001$.

ticularly in the restrictive subtype, but not in normal-weight bulimia or subclinical eating pathology. It is noteworthy that the restrictive anorexic group scored more highly on the Cognitive Error Questionnaire than the depressive subjects reported by Lefebvre (1981): the restrictors in the present sample scored 41.5, whereas Lefebvre's group scored 22.8. The present subjects may have been more disturbed than Lefebvre's sample, or perhaps the cognitive distortions in anorexia nervosa are more severe or pervasive than in depression. Regardless, this finding supports the cognitive interventions advanced by Garner (1986). Further research is needed to ascertain the role of cognitive distortions in normal-weight bulimia.

Cognitive slippage and conceptual complexity did not emerge as key components of eating pathology. The present data corroborate Swift et al. (1984) and suggest that even very seriously ill eating disordered subjects perform within normal limits in these spheres. Alternatively, the present study might have insufficient power to discriminate subtle differences in these cognitive processes. The strong group differences detected on other variables, however, mitigate against this interpretation.

Both affective measures detected significant dysphoria and depression in all four eating disordered groups. Relative to cognitive aspects, affective features may be more discriminatory in eating disorders, particularly normal-weight bulimia and subclinical pathology. However, mood and cognition do not operate in isolation; the correlations between cognitive and affective measures suggest the importance of considering their conjoint influence.

The present study thus provides a multimethod assessment of cognitive function across a range of eating disordered subjects. The findings suggest that cognitive dysfunction is in evidence in anorexia nervosa, although not on all indices. It is also apparent that affective disturbance accompanies cognitive disturbance. However, the degree to which both cognitive and affective factors play a role in the genesis and maintenance of eating pathology awaits further empirical study and specification.

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