

Personality Traits after Recovery from Eating Disorders: Do Subtypes Differ?

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ABSTRACT

Objective: We compared individuals recovered from anorexia (AN) and bulimia nervosa (BN) to determine characteristics that are shared by or distinguish eating disorder (ED) subtypes.

Method: Sixty women recovered for ≥ 1 year from AN or BN were compared with 47 control women (CW). Assessments included the Yale-Brown-Cornell Eating Disorder Scale, the Spielberger State-Trait Anxiety Inventory, the Beck Depression Inventory, the Yale-Brown Obsessive Compulsive Scale, the Temperament and Character Inventory, and Structured Clinical Interviews for DSM-IV.

Results: Individuals recovered from an ED had similar scores for mood and per-

sonality variables that were significantly higher than the scores for CW. Few recovered subjects had Cluster B personality disorder. Most individuals recovered within 6 years of their ED onset. A latent profile analysis identified an “inhibited” and “disinhibited” cluster based on personality traits.

Conclusion: A wide range of symptoms persist after recovery and do not differ between subtypes of ED. These findings may aid in identifying traits that create vulnerabilities for developing an ED.
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Keywords: personality traits; recovery; eating disorders; cluster

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Introduction

Anorexia nervosa (AN) and bulimia nervosa (BN) are severe psychiatric disorders of unknown etiology that most commonly begin during adolescence in women.¹ Although cultural pressures for thinness are often cited as a prominent factor in the pathogenesis of eating disorders (EDs), the stereotypical onset and clinical presentation of these disorders support the possibility that there is an un-

derlying biologic component that is associated with phenotypic features.²

It is well known that individuals, when ill with AN and BN, have substantial core ED symptoms like drive for thinness, psychopathology concerning eating habits, and concerns about body shape as well as high levels of anxiety, depression, and obsessiveness.^{3,4} Although many individuals with an ED have these symptoms in common, perfectionism^{4,5} may discriminate ill individuals with AN and BN. In addition, individuals with AN display specific personality traits,^{6–9} including elevated harm avoidance and decreased novelty seeking, self-directedness, and cooperativeness (the degree to which the self is viewed as a part of society). By contrast, personality profiles of women with BN are characterized by high novelty seeking, high harm avoidance, and low self-directedness.^{9,10} Finally, impulsivity is positively correlated with bulimic symptoms.¹¹

In the past decade, studies have shown that some of these symptoms occur in childhood before the onset of an ED,¹² and limited reports in the literature suggest that these symptoms appear to persist after recovery from an ED. For example, individuals recovered from AN display elevations of perfectionism and obsessions,^{13,14} anxiety, and depression¹⁵ and score high on harm avoidance and low on nov-

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elty seeking.^{13,16–19} Recovered women with BN have increased levels of depression, anxiety, and perfectionism,^{20,21} but decreased levels of harm avoidance.²²

In addition, efforts to identify clusters of individuals with EDs based on personality traits may aid in defining subgroups of individuals with EDs.^{23–25} Studies have tended to identify several subgroups including a relatively high functioning perfectionistic group, an emotionally dysregulated and impulsive group, and a compulsive and emotionally constricted group. However, these studies have been conducted with individuals who had active EDs. No such studies have been done in individuals recovered from an ED.

First, the purpose of the current study was to characterize personality traits and psychopathology in individuals who have recovered from an ED. In particular, we anticipated that measures of anxiety, compulsivity, and indicators of impulsivity would be elevated in individuals who have recovered from an ED compared with healthy control women (CW). Second, we attempted to identify whether personality-based clusters could be identified in the group of individuals recovered from an ED. If such clusters exist in recovered individuals and resemble those present in ill individuals with an ED, then it would be consistent with the idea that these personality-based groupings reflect enduring traits.

Method

Sample

Sixty women between the ages of 18 and 45 years were recruited who had previously met criteria for AN or BN as defined in the 4th ed. of the Diagnostic and Statistical Manual of Mental Disorders.¹ They were previously treated in the ED treatment program at Western Psychiatric Institute and Clinic (University of Pittsburgh Medical Center, Pittsburgh, PA) or were recruited nationally through advertisements. All individuals participated in ≥ 1 brain imaging study and underwent 4 levels of screening: (a) a brief telephone screening; (b) an intensive screening process to assess psychiatric history, lifetime weight, binge eating and methods of weight loss/control, and menstrual cycle history as well as their eating pattern for the past 12 months; (c) a comprehensive assessment using structured and semistructured psychiatric interviews conducted by telephone or in person; and (d) a face-to-face interview and physical examination with a psychiatrist. To be considered “recovered,” for

the previous year, individuals had to (a) maintain a weight $> 90\%$ of average body weight; (b) have regular menstrual cycles; (c) have not binged, purged, restricted food intake, or exercised excessively; and (d) not used psychoactive medications such as antidepressants. Also, they must not have met criteria for current alcohol or drug abuse/dependence. Forty-seven CW were recruited through local advertisements. The CW had no history of an ED or any psychiatric disorder, medical, or neurologic illness. They had normal menstrual cycles and had been within normal weight range since menarche ($> 90\%$ of average body weight). The studies were conducted according to the institutional review board regulations of the University of Pittsburgh, and written informed consent was obtained from all individuals.

Assessments

A comprehensive battery of clinical interviews and self-assessments, designed to diagnose Axis I and II disorders and assess symptoms typical in individuals with EDs, was administered to recovered individuals as well as CW. Trained doctoral-level psychologists with experience in ED administered the clinical interviews. All instruments have demonstrated good reliability and validity.

The Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I) is a semistructured clinical interview used to diagnose the major DSM-IV Axis I disorders.²⁶ The Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) is a semistructured clinical interview used to diagnose the DSM-IV personality disorders.²⁷

The Yale-Brown Obsessive Compulsive Scale (Y-BOCS) is a semistructured interview designed to assess the presence and severity of obsessive thoughts and compulsive behaviors typically found among individuals with obsessive-compulsive disorder (OCD).^{28,29} The Yale-Brown-Cornell Eating Disorder Scale (YBC-EDS) is a semistructured interview used to assess the severity and types of core preoccupations and rituals specific to EDs.³⁰ Only current severity scores were used for both of these instruments.

The State-Trait Anxiety Inventory (STAI-Y), a 40-item instrument, evaluates anxiety at the time of examination (State) and the general tendency to display anxiety (Trait).³¹ The Beck Depression Inventory (BDI) is a 21-item questionnaire that has been widely used to assess the intensity and symptoms of depression.³²

The Temperament and Character Inventory (TCI), a 240-item inventory, consists of 7 independent dimensions. Four of these test temperament (Novelty Seeking, Harm Avoidance, Reward Dependence, and Persistence). The other three dimensions test character (Self-Directedness, Cooperativeness, and Self-Transcendence).³³

TABLE 1. Demographic and eating-related variables

	CW (N = 47)		RAN (N = 21)		BAN (N = 20)		BN (N = 19)		F (df)	p Value	Group differences
	M	SD	M	SD	M	SD	M	SD			
Study age (years)	26.5	6.7	23.8	5.2	28.0	6.9	26.0	5.8	1.63 (3, 102)	.188	
Current BMI (kg/m ²)	22.1	1.7	20.9	1.9	21.5	1.8	23.6	2.9	6.21 (3, 101)	.001	1, 2, 3 < 4
High past BMI (kg/m ²)	23.0	2.1	22.3	3.2	23.7	2.9	25.5	2.8	5.62 (3, 99)	.001	1, 2 < 4
Low past BMI (kg/m ²)	20.0	1.4	13.7	1.5	14.9	1.8	19.3	2.1	92.61 (3, 99)	<.001	2, 3 < 1, 4
Age of onset (years)			17.2	4.2	15.6	2.8	16.0	2.8	1.07 (2, 42)	.353	
Length of recovery (months)			40.6	29.4	46.2	49.7	27.5	16.7	0.90 (2, 43)	.416	
Age of recovery (years)			20.6	4.1	19.4	4.6	18.3	2.9	1.136 (2, 42)	.331	
YBC-EDS											
Preoccupation	0.2	0.7	3.2	3.4	3.0	3.0	4.5	2.4	11.93 (3, 76)	<.001	1 < 2, 3, 4
Rituals	0.1	0.4	2.7	3.3	1.7	2.7	1.5	1.9	6.26 (3, 76)	.001	1 < 2
Total	0.3	0.7	5.9	6.6	4.7	5.3	5.9	3.7	9.20 (3, 76)	<.001	1 < 2, 3, 4

Note: CW = healthy control women; RAN = recovered women with anorexia nervosa, restricting type; BAN = recovered women with anorexia nervosa, binge-purging type and women with both diagnoses of anorexia nervosa and bulimia nervosa; BN = women with bulimia nervosa; BMI = body mass index; M = mean; SD = standard deviation; YBC-EDS = Yale-Brown-Cornell Eating Disorder Scale.

The Barratt Impulsiveness Scale (BIS) is a 48-item questionnaire with 4 main impulsiveness subscales: Motor, Self-Control, Sensation Seeking, and Interpersonal.³⁴

Procedure and Analysis

Of the 60 individuals recovered from ED, 21 met lifetime criteria for restricting-type AN (RAN), 8 for AN with binge-purge behaviors (BAN), 12 met lifetime criteria for both AN and BN during the course of their illness (AN-BN), and 19 met criteria for BN with no history of AN. Because of the small group size, we combined all individuals with BAN and AN-BN (referred to as BAN) after determining by a Mann-Whitney test that these groups did not differ on all dependent measures.

All data analyses were performed using SPSS, Version 11.0 (Chicago, IL) and SigmaStat, Version 2.03 (Systat Software Inc., Richmond, CA). For multiple group comparisons, one-way analysis of variance (ANOVA) was used to test for differences across the groups followed by Tukey's honestly significant difference (HSD) post-hoc comparisons. The frequencies of comorbid psychopathology across the groups were compared by means of a chi-square test (ED diagnoses) or Fisher's exact test (clusters).

These indicator variables were selected because we wish to derive the clusters on the basis of personality scales, similar to other cluster analytic studies of individuals with EDs.^{23,24} Furthermore, this would allow us to compare the personality-based clusters with other psychopathology constructs, such as OCD, substance use, or posttraumatic stress disorder (PTSD). A latent profile analysis (LPA) based on a generalized linear model with multinomial distribution was performed to identify personality-based clusters. Indicator variables included the scales of the TCI and the BIS. Parameters were estimated using maximum likelihood. The determination of the number of clusters was based jointly on minimization of the Bayesian information criteria (BIC) parsimony index³⁵ and minimization of crossclassification probabil-

ities. Assignment of cluster membership was based on Bayesian probabilities. These criteria and indices helped to determine the optimal number of clusters in the LPA, which is a significant advantage of LPA compared with traditional cluster analytic techniques.³⁶ Analysis was performed using Latent Gold version 3.0 software (Statistical Innovations, Boston, MA).³⁷

Results

Demographic and Eating-Related Variables

The women in the 3 recovered ED groups as well as the CW were of similar age (Table 1). Individuals recovered from BN had a significantly higher current and past high body mass index (BMI) compared with other groups. There was no significant difference in past low BMI for individuals with RAN and BAN, although both groups had, as expected, significantly lower BMI compared with CW and women with BN. The mean length and age of recovery and the mean age of onset were similar among the clinical subgroups. Considered together, individuals had onset at 16.3 ± 3.4 years old with a range of 11–20 years for most. Only 4 individuals were older at onset (22, 23, 25, and 27 years, respectively). Individuals were ill for 3.3 ± 3.0 years, with most recovering after being ill for <6 years. Only 3 individuals with EDs had a longer duration of illness (10, 10, and 17 years, respectively). The age that individuals were recovered was 19.6 ± 4.0 years with a range of 14–26 years for most individuals. Only 2 individuals were older at recovery and both were 32 years old. Women in the recovered ED groups scored higher than CW on the total score of the YBC-EDS, but only women with RAN scored higher than CW on the Ritual subscale.

TABLE 2. Mood and personality variables

	CW (N = 47)		RAN (N = 21)		BAN (N = 20)		BN (N = 19)		F (df)	p Value	Group differences
	M	SD	M	S	M	SD	M	SD			
BDI	1.1	1.5	6.3	6.0	5.2	5.1	6.4	5.8	10.43 (3, 95)	<.001	1 < 2, 3, 4
TCI											
Novelty Seeking	20.5	4.8	17.3	5.4	18.6	6.1	20.2	6.5	1.78 (3, 96)	.156	
Harm Avoidance	10.7	3.7	16.3	7.2	17.7	7.8	16.9	7.9	8.78 (3, 96)	<.001	1 < 2, 3, 4
Reward Dependence	19.2	2.7	17.2	3.6	17.4	3.5	18.2	4.3	2.22 (3, 96)	.090	
Persistence	4.7	1.8	6.3	1.9	6.1	1.3	6.3	1.7	6.20 (3, 96)	.001	1 < 2, 3, 4
Self-Directedness	39.4	3.7	32.8	6.0	33.2	6.9	33.6	7.9	10.01 (3, 96)	<.001	1 > 2, 3, 4
Cooperativeness	38.6	1.9	37.0	2.5	35.3	7.6	37.0	5.3	2.88 (3, 96)	.040	3 < 1
Self-Transcendence	12.0	5.2	16.0	6.8	13.2	7.7	15.2	6.5	2.31 (3, 96)	.810	
State-Trait Inventory											
State Anxiety	26.2	5.4	34.8	12.6	31.3	7.2	37.9	9.4	10.78 (3, 97)	<.001	1 < 2, 4
Trait Anxiety	27.2	5.1	38.0	11.5	37.7	9.5	42.3	8.8	19.55 (3, 97)	<.001	1 < 2, 3, 4
BIS											
Motor	34.9	6.8	39.9	6.2	38.9	6.9	40.7	7.4	3.30 (3, 73)	.025	1 < 2, 4
Sensation Seeking	68.6	13.8	72.1	15.0	67.5	13.1	68.7	12.9	0.35 (3, 73)	.792	
Self-Control	79.2	18.0	84.5	22.3	81.6	19.4	90.4	21.7	1.03 (3, 73)	.383	
Interpersonal	20.1	5.8	21.4	7.7	19.8	6.2	17.7	5.8	0.84 (3, 73)	.479	
Y-BOCS (total)	0.3	1.2	5.8	7.5	8.8	8.2	7.0	8.2	8.54 (3, 76)	<.001	1 < 2, 3, 4

Note: CW = healthy control women; RAN = recovered women with anorexia nervosa, restricting type; BAN = recovered women with anorexia nervosa, binge-purging type and women with both diagnoses of anorexia nervosa and bulimia nervosa; BN = women with bulimia nervosa; M = mean; SD = standard deviation; BDI = Beck Depression Inventory; TCI = Temperament and Character Inventory; BIS = Barratt Impulsiveness Scale; Y-BOCS = Yale-Brown Obsessive Compulsive Scale.

TABLE 3. Axis I and Axis II diagnoses within eating disorder subtypes

	RAN (N = 21)	BAN (N = 20)	BN (N = 19)	χ^2 (df)	p Value	Group differences
<i>Axis I</i>						
Major depressive disorder	52.7%	77.8%	72.7%	2.87 (2)	.239	
Obsessive-compulsive disorder	63.2%	63.2%	36.4%	2.50 (2)	.286	
Panic disorder	0%	15.8%	0%	5.05 (2)	.080	
Social phobia	10.5%	15.8%	27.3%	1.44 (2)	.448	
Posttraumatic stress disorder	10.5%	22.2%	30.0%	1.78 (2)	.410	
Generalized anxiety disorder	5.3%	0%	0%	0.45 (2)	.447	
Alcohol abuse/dependence	21.0%	26.3%	45.5%	2.11 (2)	.348	
Drug abuse/dependence	10.5%	15.8%	0%	1.90 (2)	.387	
<i>Axis II</i>						
Cluster A	5.3%	0%	0%	1.56 (2)	.459	
Cluster B	5.3%	10.5%	0%	1.29 (2)	.524	
Cluster C	42.1%	42.1%	20.0%	1.65 (2)	.438	

Note: RAN = recovered women with anorexia nervosa, restricting type; BAN = recovered women with anorexia nervosa, binge-purging type and women with both diagnoses of anorexia nervosa and bulimia nervosa; BN = women with bulimia nervosa.

Mood and Personality Variables

The recovered ED subgroups (Table 2) did not differ in depression, anxiety, obsessions, and compulsions (subscales of the Y-BOCS not shown), or harm avoidance and persistence, and all recovered women in the ED groups scored significantly higher on these subscales compared with the CW. The CW scored significantly higher than all recovered groups on measures of self-directedness.

DSM-IV Axis I and Axis II Disorders

Women in the recovered ED groups had similar rates of Axis I and II disorders. The most common Axis II diagnoses were Cluster C personality disorders, which showed a similar distribution across all subtypes (Table 3).

Results of the LPA

The results of the LPA showed that 2 clusters emerged in 55 recovered individuals. Women in Cluster 1 ($n = 29$) scored higher than women in Cluster 2 on the Novelty Seeking and Self-Transcendence (the extent to which a person identifies the self as an integral part of the universe as a whole) subscales of the TCI and on the Impulsivity subscale of the BIS. In contrast, women in Cluster 2 ($n = 26$) had higher scores on Harm Avoidance than women in Cluster 1 (see Table 5). However, women in Cluster 1 did not differ from CW on novelty seeking and harm avoidance, whereas women in Cluster 2 did not differ from CW on self-transcendence. The remaining 5 individuals had missing values on variables used for the LPA. Women in the 2 clusters and CW were of similar age and current and high

TABLE 4. Demographic and eating-related variables within clusters

	CW (N = 47)		Cluster 1 (N = 29)		Cluster 2 (N = 26)		F (df)	p Value	Group differences
	M	SD	M	SD	M	SD			
Study age (years)	26.5	6.7	25.9	6.8	25.4	5.1	0.23 (2, 98)	.793	
Current BMI (kg/m ²)	22.1	1.7	22.1	2.9	21.7	2.0	0.37 (2, 97)	.691	
High past BMI (kg/m ²)	23.0	2.1	23.6	3.4	23.5	2.8	0.50 (2, 95)	.607	
Low past BMI (kg/m ²)	20.0	1.4	16.0	2.9	15.9	3.2	33.30 (2, 95)	<.001	1, 2 < CW
Age of onset (years)			16.5	3.6	16.2	3.2	0.08 (1, 42)	.785	
Length of recovery (months)			39.5	40.1	38.0	32.6	0.02 (1, 43)	.886	
Age of recovery (years)			19.8	4.9	19.4	3.0	0.10 (1, 43)	.751	
YBC-EDS									
Preoccupation	0.2	0.7	3.3	3.0	3.5	3.4	15.65 (2, 75)	<.001	CW < 1, 2
Rituals	0.1	0.4	1.7	2.6	2.5	3.0	8.43 (2, 75)	<.001	CW < 1, 2
Total	0.3	0.7	5.0	5.4	6.0	5.9	13.27 (2, 75)	<.001	CW < 1, 2

Note: CW = healthy control women; M = mean; SD = standard deviation; BMI = body mass index; YBC-EDS = Yale-Brown-Cornell Eating Disorder Scale.

TABLE 5. Comparisons of mood and personality variables within clusters

	CW (N = 47)		Cluster 1 (N = 29)		Cluster 2 (N = 26)		F (df)	p Value	Group differences
	M	SD	M	SD	M	SD			
BDI	1.1	1.5	5.4	5.0	6.5	6.2	15.85 (2, 96)	<.001	CW < 1, 2
TCI									
Novelty Seeking	20.5	4.8	22.6	4.8	14.3	3.8	24.63 (2, 97)	<.001	2 < CW, 1
Harm Avoidance	10.7	3.7	13.0	6.8	21.4	5.6	35.07 (2, 97)	<.001	CW, 1 < 2
Reward Dependence	19.2	2.7	18.5	2.6	16.5	4.5	5.75 (2, 97)	.004	2 < CW
Persistence	4.7	1.8	6.3	1.6	6.2	1.6	9.35 (2, 97)	<.001	CW < 1, 2
Self-Directedness	39.4	3.7	33.3	6.5	33.1	7.3	15.07 (2, 97)	<.001	1, 2 < CW
Cooperativeness	38.6	1.9	36.8	4.0	36.0	6.9	3.62 (2, 97)	.030	2 < CW
Self-Transcendence	12.0	5.2	17.7	6.7	11.5	5.8	10.71 (2, 97)	<.001	CW, 2 < 1
State-Trait Inventory									
State Anxiety	26.2	5.4	32.1	8.7	37.4	11.2	16.25 (2, 98)	<.001	CW < 1, 2; 1 < 2
Trait Anxiety	27.2	5.1	38.8	9.9	39.7	10.4	27.09 (2, 98)	<.001	CW < 1, 2
BIS									
Motor	34.9	6.8	41.6	6.3	37.7	6.6	6.95 (2, 74)	.002	CW < 1
Sensation Seeking	68.6	13.8	78.1	10.9	59.7	8.8	13.79 (2, 74)	<.001	2 < CW < 1
Self-Control	79.2	18.0	97.5	16.3	71.1	16.4	14.5 (2, 74)	<.001	CW, 2 < 1
Interpersonal	20.1	5.8	23.6	5.2	15.3	5.4	12.68 (2, 74)	<.001	2 < CW, 1
Y-BOCS (total)	0.3	1.2	8.0	8.7	6.6	7.2	11.83 (2, 75)	<.001	CW < 1, 2

Note: CW = healthy control women; M = mean; SD = standard deviation; BDI = Beck Depression Inventory; TCI = Temperament and Character Inventory; BIS = Barratt Impulsiveness Scale; Y-BOCS = Yale-Brown Obsessive Compulsive Scale.

past BMI (Table 4), but the women in the ED clusters had a significantly lower past low BMI. The mean length of recovery and the mean age of recovery were similar between clusters. Women in both clusters scored similarly on the subscales and total score of the YBC-EDS, but still higher than CW. They also reported significantly more depression and trait anxiety than CW (Table 5). On state anxiety ratings, however, not only did women in both clusters differ from controls, but women in Cluster 2 scored significantly higher than women in Cluster 1, reflecting higher levels of state-oriented anxiety in this particular cluster. As can be seen in Table 6, the clusters did not differ significantly in any Axis I or Axis II diagnoses on the

SCID-I or SCID-II, including the subtype of their previous ED.

Conclusion

The current study confirms and extends studies showing that symptoms persist after recovery from AN and BN.^{20–22,38,39} In addition, this study provides a more comprehensive overview of a wide range of symptoms, some of which have not been presented in the very limited literature on individuals recovered from AN or BN. We found that mean values

TABLE 6. Comparison of axis I and II disorders between clusters

	Cluster 1 (N = 29)	Cluster 2 (N = 26)	Fisher's exact Test <i>p</i> value	Group differences
<i>SCID-I</i>				
Major depressive disorder	68%	61.9%	.760	
Obsessive-compulsive disorder	57.7%	57.1%	1.000	
Panic disorder	3.8%	4.8%	1.000	
Social phobia	11.5%	23.8%	.437	
Posttraumatic stress disorder	8%	30%	.113	
Alcohol abuse/dependence	23.1%	38.1%	.342	
Drug abuse/dependence	7.7%	9.5%	1.000	
<i>SCID-II</i>				
Cluster A	0%	4.8%	.468	
Cluster B	4%	9.5%	.585	
Cluster C	32%	52.4%	.231	

for anxious, depressive, and obsessive symptoms tended to be elevated in individuals recovered from AN and BN compared with the CW. Symptoms of depression and anxiety have been shown to persist in individuals recovered from AN^{13,15–17,40} and BN^{20,41} when compared with healthy women. Moreover, recovered individuals have decreased levels of mood disturbances compared with individuals ill with ED.^{42–44} Similarly, obsessions and compulsions have been reported to be elevated in individuals recovered from AN^{13,14,16} and BN^{20,21} compared with CW. It is noteworthy that because anxious and obsessional symptoms have their onset in childhood before the appearance of ED symptoms,^{12,45,46} it is possible that these are traits that create a susceptibility to the development of an ED.

The current study found that factors, such as harm avoidance, remained elevated in recovered individuals, whereas scores for novelty seeking were similar to those of controls. Some studies have found high levels of harm avoidance^{13,16,18} or low levels of novelty seeking^{16,17} compared with controls, as in our study, whereas others did not.^{38,39,41,47} Inconsistent findings might be explained by methodologic issues. Most of these studies lack a sufficient follow-up time, varying from immediately after weight recovery⁴⁷ to 1 year,⁴¹ or did not define recovery. Our study used rigorous criteria for recovery, demanding stable weight and menstrual cycle for ≥ 1 year. As recovery from ED is characterized by relapses,⁴⁸ studies with insufficient recovery times could be biased by the presence of subthreshold illnesses in the recovered group.

One striking finding was that individuals recovered from EDs were more similar than different regardless of eating disorder diagnosis. This was true for personality and temperament scores, as well as core ED symptoms, mood, and lifetime Axis I and Axis II disorders. Other studies have found similar findings, except that one study found higher harm avoidance scores in individuals with AN com-

pared with individuals with BN, but not compared with individuals with AN-BN,¹⁸ whereas another study reported lower novelty-seeking scores in individuals with RAN compared with individuals with BN.¹⁹ In contrast, there is evidence for differences in ill ED subgroups in terms of personality variables. In particular, subtype analyses revealed that individuals with RAN and purging-type AN (PAN) reported the lowest novelty seeking, individuals with RAN the highest persistence and self-directedness, and individuals with PAN the highest harm avoidance.^{8–10}

Over the long term, $\geq 50\%$ of individuals with ED recover.^{48–53} However, it is not known who will have a good outcome. Some follow-up studies associated OCD with poor outcome.^{49,50,53} The fact that individuals recovered from AN and BN appear to be so similar raises the possibility that common factors may be associated with good outcome. These factors may include high harm avoidance but not the presence of social phobia or generalized anxiety disorder. Another important finding was the low rate of Cluster B disorders (5%–10%) in women recovered from an ED. In contrast, studies of Cluster B disorders show a range of 20%–30% for women ill with RAN, BAN, and BN.^{54,55} It is noteworthy that we did not find any lifetime drug abuse/dependence in the recovered BN subgroup and low rates (15.8%) in the BAN subgroup. It is well known that substance problems are common in bulimic-type ED with rates ranging from 20% to 40%.^{56,57} Together, these data are consistent with suggestions^{54,55} that impulse dyscontrol is associated with poor outcome. Still, the cross-sectional nature of the current study leaves these questions unresolved. In addition, it is not known whether differences in temperament or other symptoms between ill and recovered individuals are a consequence of malnutrition exaggerating symptoms, or are factors that contribute to poor outcome and chronicity.

These findings raise the question of whether subtyping EDs based on diagnostic groups is justified. Studies reporting a high crossover rate between diagnoses and subtypes^{58,59} also call into question the usefulness of diagnostic subtypes. In an attempt to identify other behavioral groupings of patients recovered from ED, we applied an LPA. Two clusters emerged. Women in Cluster 2 seem to be more inhibited, with high scores of harm avoidance and state anxiety. Women in Cluster 1 can be described as disinhibited and are characterized by greater impulsivity, but also had some degree of anxiety and obsessiveness. There are only a few studies in the literature that have described personality-based clusters in participants with EDs. We replicated in the current study two of those previously described clusters, the impulsive and the inhibited, anxious subgroups of ED.^{23–25,60} These findings may suggest that individuals would benefit from a treatment approach tailored to these personality features as in a dialectical behavior psychotherapy approach, for example. It is not known whether individuals fit into similar symptom complexes pre-morbidly, as children, or when ill with an ED. If this was so, then, perhaps, such symptom clusters might be useful in predicting outcome. In addition, these personality features could be targeted in children if identified early for prevention purposes. Parents of these children could be educated about healthy body image, for instance. But, in general, the clinical and research usefulness of these clusters remains to be determined.

The current study found that women in all three ED subgroups had a similar age of onset and age of recovery. They seem to have the onset of their ED at approximately 16 years and to be recovered by their early 20s, after being ill for <6 years. These data are similar to those reported by Strober et al.,⁴⁸ who described that “the accelerating force of recovery runs fairly steady through year 6, at which point the likelihood of recovering decelerates and reaches a plateau after 10 years” (p. 347). Just as AN and BN have an onset over a relatively narrow range of teenage years, it now appears that recovery may also take place over a relatively narrow age into the mid 20s. This is important information, as it provides families with a realistic expectation of the potential time course of this illness.

In terms of limitations, the control group was screened to be free of Axis I pathology. This may have resulted in larger group differences than would have been obtained with an unscreened community sample. Five individuals (8.3%) were dropped from the LPA because of missing values, decreasing the size of the cluster sample. The cur-

rent study defined recovery as normal nutrition, weight, menses, and no medication, for more than a continuous 1-year period. In fact, most individuals were recovered for much longer than 1 year. Although there is no standardized definition of recovery, the definition in the current study was more rigorous than in many others. However, recovery status was based on self-report. Moreover, some studies⁴⁸ suggest that relapse is uncommon after sustained recovery. It could be argued that the continued presence of ED symptoms may indicate that individuals are not truly recovered. However, our experience in studies of >100 recovered individuals is that even after many years of recovery they still have strong concerns about weight, shape, and food. It is not known whether any self-selection factors, in terms of who might be willing to do these invasive studies, biased recruitment. For example, it is possible that individuals with EDs with very high harm avoidance might not participate in invasive studies. Nevertheless, the levels of harm avoidance are comparable to other studies with a similar definition of recovery.¹⁸

Our study suggests several main findings. A wide range of classic ED symptoms persist after recovery and do not differ between subtypes of ED, suggesting that they are traits rather than state-related disturbances. Individuals who recover from an ED look remarkably similar to each other, and appear to have lower rates of some psychopathology, such as Cluster B disorders, than are typically reported in ill individuals. These findings may be useful in understanding factors associated with good outcome. As clusters of ED are more defined by personality features than by classical eating pathology, these data are relevant for treatment and prevention in childhood.

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