

The Relationship Between Temperament and Impulsive Behaviors in Eating Disordered Subjects

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To date, few studies have examined the personality characteristics and clinical predictors of impulsive behaviors in eating disorders (ED). The aim of this work was to study the prevalence of a wide range of impulsive behaviors in a sample of 554 ED subjects and to examine the predictors of these behaviors. Subjects were diagnosed according to DSM-IV criteria as having anorexia nervosa restricting type (ANR; n = 183), anorexia nervosa binge eating/purging type (ANBP; n = 65), bulimia nervosa purging type (BNP; n = 244), and bulimia nervosa nonpurging type (BNNP; n = 62). Nine different types of impulsive behaviors were assessed in these groups. About 55% of the whole sample reported at least one type of impulsive behavior, 35% more than one, and about 13% more than three. According to findings, impulsive and multi-impulsive subjects are characterized by the presence of purging behavior and by specific temperamental features such as high levels of novelty seeking and low persistence. The prediction of impulsive behavior is further improved by considering the presence of a history of childhood abuse, maternal psychiatric morbidity, and some specific psychological symptoms such as maturity fears, perfectionism, depression, and obsessive-compulsive symptoms. The presence of impulsive behavior appears to be associated with overall higher levels of psychiatric symptomatology and eating psychopathology, thus indicating that they are an important feature to be considered in the assessment and treatment of ED.

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Impulsivity is an important issue with regard to personality traits in eating disorders (ED). Although impulsivity is mentioned in the *Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV*; American Psychiatric Association [APA], 1994) no clear and comprehensive definition is described in the manual. Additionally, the measurement of impulsivity remains a problematic question. Usually, impulsivity is defined as the presence of behavior that is supposed to be impulsive in nature (Fahy & Eisler, 1993). More complete definitions of impulsivity, however, suggest that such behaviors tend to be committed without forethought or conscious judgment, and are characterized by acting on the spur of the moment, the inability to focus on a specific task, and a lack of adequate planning (Moeller, Barratt, Dougherty, Schmitz, & Swann, 2001). Some authors include temperamental traits, such as sensation seeking and risk taking, in the definition of impulsivity (Eysenck & Eysenck, 1977). Finally, Cloninger (1996) defines impulsive behavior as the coexistence of four heritable temperamental traits: high novelty seeking, low harm avoidance, low persistence, and, rarely, high reward dependence.

Impulsive behaviors appear to be a transdiagnostic characteristic in ED patients. Although clinically associated with the presence of binge eating, impulsive behavior is not uncommon among other ED subtypes, even restricting anorexia nervosa (Favaro & Santonastaso, 2000; Vandereycken & Van Houdenhove, 1996). Several studies have examined the relationship between ED and specific impulsive behaviors such as impulsive self-injurious behavior (Favaro & Santonastaso, 1998, 2000; Favazza, De Rosear, & Conterio, 1989; Paul, Schroeter, Dahme, & Nutzinger, 2002), attempted suicide (Bulik, Sullivan, & Joyce, 1999; Favaro & Santonastaso, 1997), substance and alcohol abuse (Welch & Fairburn, 1996), stealing (Krahn, Nairn, Gosnell, & Drewnowski, 1991; Vandereycken & Van Houdenhove, 1996), and compulsive buying (Lejoyeux, Ades, Tassain, & Solomon, 1996). Others have studied individuals who exhibit a variety of impulsive behaviors and hypothesized the existence of a subgroup of ED patients with a multi-impulsive syndrome (Lacey & Evans, 1986; Lacey, 1993; Nagata, Kawarada, Kiriike, & Iketani, 2000). This latter group of patients is characterized by a failure to control impulsive eating behavior (e.g., a purging form of bulimia nervosa) as well as the co-occurrence of various non-ED impulsive behaviors such as alcohol abuse, illicit drug use, deliberate self-injurious behavior, suicide attempts, sexual disinhibition, and shoplifting. Few studies, however, have examined the relationship between personality characteristics and various clinical predictors of impulsive behavior in ED patients.

The aim of the present work was to study the prevalence of a wide range of impulsive behaviors in a large sample of full-syndrome ED subjects and to examine the diagnostic, clinical, and temperamental characteristics that are associated with the presence of such behaviors.

METHOD

Subjects

The subjects were 554 patients with a full syndrome eating disorder, consecutively referred to our ED Outpatient Unit from 1997 to 2003. Using *DSM-IV* (APA, 1994) criteria, the subjects were diagnosed as having anorexia nervosa restricting type (ANR; $n = 183$), anorexia nervosa binge-eating/purging type (ANBP; $n = 65$), bulimia nervosa purging type (BNP; $n = 244$), and bulimia nervosa nonpurging type (BNNP; $n = 62$). The age of the sample ranged from 12–61 years with a mean of 23.9 years ($SD = 6.5$).

Procedure

Clinical interviews were performed using the ED diagnostic section of the Structured Clinical Interview for *DSM-IV* (SCID; First, Spitzer, Gibbon, & Williams, 1995). In addition, a semistructured interview explored eating symptoms and attitudes, weight, menstrual status, previous treatments, and other clinical features. One section of the interview investigated the presence of a range of impulsive behaviors such as suicide attempts, skin cutting, skin burning, other impulsive self-damaging behaviors (e.g., head or hands banging, self-hitting), substance/alcohol abuse, stealing, running away from home, seeking out dangerous situations (e.g., careless driving, crossing a road without caution), and being aggressive with others. Every behavior was defined as present even when episodic (i.e., if it ever occurred in their life), with the exception of alcohol abuse. Self-induced vomiting was considered present when it occurred at least two times per week. Laxative and/or diuretic abuse was defined as present or previously recurrent when subjects reported the inappropriate use of unprescribed laxatives or diuretics (i.e., at least two times per week).

Substance/alcohol abuse was defined as the episodic or recurrent use of illicit drugs (benzodiazepines were excluded) and the presence or a history of recurrent alcohol abuse (more than seven units per episode). A history of childhood sexual or physical abuse was considered only when it occurred before the age of 18. We also collected data about family psychiatric morbidity, which was defined as psychiatric contacts, pharmacological treatments, and current or previous psychiatric admissions of the subject's parents. These family data were available for 82.5% of the sample.

We administered the Hopkins Symptom Checklist (SCL-90; Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974), the Eating Disorders Inventory (EDI; Garner, Olmstead, & Polivy, 1983), and the Tridimensional Personality Questionnaire (TPQ; Cloninger, 1987) as part of a routine initial assessment.

STATISTICAL ANALYSES

We used the Statistical Package for Social Sciences (SPSS) software for statistical analyses. Chi-square (with Yates' continuity correction for 2×2 tables) was used with nominal variables. Groups were compared by means of one-way ANOVA. Given the presence of a large series of comparisons, only p values < 0.005 were considered significant. For post-hoc comparisons, Bonferroni correction was used. Stepwise logistic regression analysis and multiple regression analysis were used to extrapolate the clinical and psychological predictors for the presence and the number of impulsive behaviors.

RESULTS

Table 1 shows the frequency of the different types of impulsive behaviors in the total sample ($N = 554$) as well as in the four diagnostic subgroups. The number of different impulsive behaviors significantly differentiates the four diagnostic subgroups (ANR: 0.78 ± 1.4 ; ANBP: 1.58 ± 1.6 ; BNP: 1.79 ± 1.9 ; BNNP: 1.06 ± 1.5 ; Kruskal Wallis test: $\chi^2 = 50.1$; d.f. = 3; $p < 0.001$). About 55% of the whole sample reported at least one type of impulsive behavior, 35% more than one, and about 13% more than three. Table 2 shows the differences between subjects without impulsive behavior, subjects with one–three different impulsive behaviors, and subjects with more than three types of impulsive behaviors. Many of the adjunctive measures, such as the EDI

TABLE 1. Impulsive Behaviors in the Four Diagnostic Subgroups of Eating Disorder Subjects

	Whole sample ($n = 554$)	Restricting AN ($n = 183$)	Binge eating/ purging AN ($n = 65$)	Purging BN ($n = 244$)	Nonpurging BN ($n = 62$)
Suicide attempts*	55 (10%)	6 (3%)	9 (14%)	35 (14%)	5 (8%)
Skin cutting	87 (16%)	21 (12%)	10 (15%)	48 (20%)	8 (13%)
Skin burning	18 (3%)	5 (3%)	1 (2%)	10 (4%)	2 (3%)
Other self-damaging behaviors	96 (17%)	20 (11%)	14 (22%)	50 (20%)	12 (19%)
Seeking out dangerous situations*	77 (14%)	10 (6%)	13 (20%)	47 (19%)	7 (11%)
Aggressive towards others	71 (13%)	18 (10%)	8 (12%)	39 (16%)	6 (10%)
Running away*	101 (18%)	20 (11%)	15 (23%)	59 (24%)	7 (11%)
Stealing*	137 (25%)	26 (14%)	16 (25%)	81 (33%)	14 (23%)
Substance/ alcohol abuse*	110 (20%)	16 (9%)	17 (26%)	68 (28%)	9 (15%)

*The difference among the four groups is significant at $p \leq 0.001$.

TABLE 2. Differences Between Subjects Without Impulsive Behavior, with 1–3 Types of Impulsive Behaviors, and with More than 3 Different Types of Behaviors

	Subjects without impulsive behavior (<i>n</i> = 249) Mean (<i>SD</i>)	Subjects with 1–3 impulsive behaviors (<i>n</i> = 232) Mean (<i>SD</i>)	Subjects with more than 3 impulsive behaviors (<i>n</i> = 73) Mean (<i>SD</i>)	F(2, 551)	Post-hoc analysis
Age	23.5 (7.0)	24.4 (6.3)	23.3 (5.3)	1.38	
Duration of illness	39.6 (52.9)	45.5 (50.4)	51.1 (47.4)	1.72	
Age of onset	18.9 (5.2)	18.6 (4.9)	17.5 (3.4)	2.33	
Body mass index	18.4 (4.1)	19.3 (3.9)	19.6 (3.5)	4.57	
EDI drive for thinness	11.7 (7.0)	13.7 (6.5)	14.6 (6.5)	7.44*	0 < 1 < 2
EDI interocept. awareness	8.7 (6.4)	11.1 (6.3)	15.3 (6.6)	31.84*	0 < 1 < 2
EDI bulimia	7.4 (6.7)	9.9 (6.3)	12.6 (6.6)	20.67*	0 < 1 < 2
EDI body dissatisfaction	13.8 (7.9)	15.2 (8.2)	16.5 (8.6)	3.72	
EDI ineffectiveness	8.4 (7.0)	10.6 (7.0)	13.6 (8.3)	15.87*	0 < 1 < 2
EDI maturity fears	6.9 (4.5)	8.0 (5.0)	8.9 (5.9)	5.59	
EDI perfectionism	4.5 (3.6)	5.7 (4.1)	8.1 (5.2)	21.44*	0 < 1 < 2
EDI interpersonal distrust	6.1 (4.9)	6.6 (4.7)	8.7 (5.7)	7.75*	0, 1 < 2
SCL obsess. compulsive	1.3 (0.8)	1.7 (0.9)	2.2 (0.8)	31.09*	0 < 1 < 2
SCL depression	1.5 (0.9)	1.9 (0.9)	2.5 (1.0)	33.29*	0 < 1 < 2
SCL anxiety	1.3 (0.8)	1.6 (0.9)	2.2 (1.0)	31.86*	0 < 1 < 2
SCL hostility	1.0 (0.8)	1.3 (0.9)	1.8 (1.0)	23.75*	0 < 1 < 2
TPQ novelty seeking	15.4 (5.2)	17.1 (5.5)	20.2 (4.7)	24.61*	0 < 1 < 2
TPQ harm avoidance	20.6 (6.2)	21.4 (6.3)	22.6 (6.3)	3.08	
TPQ reward dependence	14.4 (3.9)	14.8 (4.0)	14.1 (4.0)	1.23	
TPQ persistence	5.9 (1.8)	5.8 (2.0)	5.3 (2.2)	2.60	
Restricting AN	114 (46%)	58 (25%)	11 (15%)	χ^2	
Binge eating/purging AN	23 (9%)	33 (14%)	9 (12%)	48.25*	(d.f. = 6)
Purging BN	79 (32%)	117 (50%)	48 (66%)		
Nonpurging BN	33 (13%)	24 (10%)	5 (7%)		
Childhood abuse	6 (2%)	28 (12%)	22 (31%)	46.97*	(d.f. = 2)
Maternal psych. morbidity	41 (20%)	62 (32%)	8 (50%)	19.65*	(d.f. = 2)
Paternal psych. morbidity	32 (16%)	34 (18%)	13 (23%)	1.64	(d.f. = 2)

*The difference among the four groups is significant at $p \leq 0.001$.

Note: Data about family psychiatric morbidity were collected for 457 subjects (82.5% of the whole sample).

and SCL subscales, showed a dose-effect relationship with the number of impulsive behaviors.

A logistic regression analysis was used to analyze the predictors of the presence of at least one impulsive behavior. The independent variables included in the analysis were: age; age of onset; duration of illness; body mass index; all the eight EDI subscales; the obsessive-compulsive, depression, anxiety, and hostility SCL subscales; the novelty seeking, harm avoidance, reward dependence, and persistence TPQ subscales; the presence of recurrent purging behavior (at least twice per week); the presence of a diagnosis of anorexia nervosa; the presence of recurrent binge eating (at least twice per week); and a history of a childhood sexual or physical abuse. Maternal and paternal psychiatric morbidity were not included in

these multivariate analyses because data were available only for 82.5% of the subjects.

The extrapolated significant predictors were: the presence of purging behavior ($B = 0.72$; Wald = 12.83; $p < 0.001$; Exp(B) = 0.49), high EDI maturity fears ($B = 0.05$; Wald = 6.04; $p < 0.02$; Exp(B) = 1.05), high SCL obsessive-compulsive scores ($B = 0.45$; Wald = 15.67; $p < 0.001$; Exp(B) = 1.58), a history of childhood abuse ($B = 1.70$; Wald = 13.67; $p < 0.001$; Exp(B) = 5.46), and high TPQ novelty seeking ($B = 0.07$; Wald = 12.16; $p < 0.001$; Exp(B) = 1.07). The model was highly significant ($\chi^2 = 101.83$; d.f. = 5; $p < 0.001$).

The same variables were used as independent variables in a multiple regression analysis, using the number of impulsive behaviors as the dependent variable. The extrapolated variables were: high SCL depression ($\beta = 0.20$; $t = 4.66$; $p < 0.001$), high TPQ novelty seeking ($\beta = 0.21$; $t = 5.33$; $p < 0.001$), a history of childhood abuse ($\beta = 0.20$; $t = 5.26$; $p < 0.001$), high EDI perfectionism ($\beta = 0.17$; $t = 4.05$; $p < 0.001$), younger age at onset ($\beta = -0.010$; $t = -2.63$; $p < 0.01$), high EDI maturity fears ($\beta = 0.10$; $t = 2.68$; $p < 0.01$), the presence of purging behavior ($\beta = 0.09$; $t = 2.29$; $p < 0.03$), and low TPQ persistence ($\beta = -0.09$; $t = -2.25$; $p < 0.03$). The model was highly significant (Adjusted R squared = 0.292; $F(8, 525) = 25.44$; $p < 0.001$). Maternal and paternal psychiatric morbidity were not included in the main analyses because these data were available only for a subset of the whole sample. However, performing the same analyses in this subsample, we observed a significant effect of maternal psychiatric morbidity in both the models.

DISCUSSION

The present study found that impulsive behaviors are present in all four diagnostic subgroups of eating disorders. Although most restricting type anorexic subjects did not report any impulsive behaviors (62% of ANR), a substantial minority reported multi-impulsive behaviors (15%).

From a trans-diagnostic point of view, a particularly interesting finding emerges. The data in this study do not support the view that impulsive behaviors are specifically associated with the presence of binge eating. The factor that significantly predicts the presence and number of impulsive behaviors is the presence of purging behavior. This also is supported by the findings in Tables 1 and 2 that indicate a lower prevalence of impulsive behaviors in the nonpurging bulimia nervosa subgroup. This finding confirms the present classification in *DSM-IV* (APA, 1994), which indicates a clear distinction between purging and nonpurging bulimic individuals. It also confirms the earlier observations of Garner, Garner, and Rosen (1993), indicating that there are more severe clinical features found in purging versus nonpurging ED subjects.

Many other interesting findings emerged from our analyses. First is the role of temperamental factors in predicting impulsive behaviors. Eating disorders are characterized by typical temperamental characteristics (Fassino, Abbate Daga, Amianto, Leombruni, Boggio, & Rovera 2002; Klump et al., 2000). For example, all ED subjects seem to display high levels of harm avoidance compared with control subjects (Brewerton, Hand, & Bishop, 1993; Fassino et al., 2002). In addition, patients displaying bulimic features show high novelty seeking, while restricting anorexic patients show high persistence scores. In the entire sample of our study, the presence of impulsive behaviors was significantly predicted by high levels of novelty seeking, whereas the number of impulsive behaviors was predicted by both high novelty seeking and low persistence. These findings partially confirm the model proposed by Cloninger (1996), who described impulsivity as the presence of high novelty seeking, low harm avoidance, and low persistence. The presence of a high prevalence of impulsive behaviors in a sample with high levels of harm avoidance would seem contradictory. However, ED subjects are frequently characterized by the coexistence of both high impulsivity and high compulsivity (Brewerton et al., 1993; Cloninger, 1996; Newton, Freeman, & Munro, 1993), which helps to explain the variation in the temperamental features of this group of patients.

Other factors emerged as important features associated with impulsive behaviors. All of the EDI and the SCL subscales appear to have a dose-dependent relationship with impulsivity, indicating that the presence of different types of impulsive behaviors is associated with more severe eating pathology and psychiatric symptoms (Table 2). In particular, the role of EDI maturity fears emerged as a significant predictor of both the presence and number of impulsive behaviors. Patients with impulsive behaviors described themselves as significantly more childish, immature, and fearful of growth. This might be the consequence of their impulsivity, which makes it more difficult to cope with the problems of adult life and to be recognized as an adult by family members, teachers, and friends. However, impulsive behaviors also might be considered one of the manifestations of the difficulties in facing the problems of adolescence and early adulthood that have led to the development of an ED.

Impulsive subjects reported a significantly higher frequency of childhood abuse experiences, supporting the existing literature on the association between impulsive self-harming behavior and abuse (Favaro & Santonastaso, 1998, 2000). Childhood abuse appears to be an independent factor that potentially increases the development of different types of impulsive behaviors. Early traumatic experiences can lead to various types of dysregulation including dissociation, affective instability, and poor modulation of impulsive behaviors.

Another independent predictor of impulsivity appears to be the presence of a positive maternal psychiatric history. This factor could indicate both the presence of a genetic vulnerability for the development of impulsive

behaviors in ED patients as well as failures in the adult role model in the complex process of adolescent identity formation.

Although impulsive behaviors are usually considered a characteristic feature of early adolescence, age did not emerge as a significant factor in the prediction of impulsive behaviors among those with ED. This is probably due to the fact that emotional growth problems are a common feature of these subjects, as reflected by the high levels of maturity fears and perfectionism. However, early-age-of-onset did emerge as a significant and independent predictor of the number of different impulsive behaviors reported.

Finally, impulsive behaviors are typically considered one of the main symptoms of borderline personality disorder. The temperamental correlates of impulsive behavior in our sample (especially with regard to the novelty seeking factor) are usually associated with a personality disorder of the B cluster type (Mulder & Joyce, 1997). However, many questions need to be answered concerning the relationship between ED and personality disorders. The typical onset of ED during adolescence could suggest that these disturbances may have a role in the development of personality disorders (Halmi, 2003) or, more simply, that they are an expression of personality dysfunction. Our clinical observations indicate that the presence of impulsive or multi-impulsive features in ED subjects is not necessarily an index of the presence of a personality disorder, since some impulsive behaviors improve or disappear with the remission of the ED. This suggests that the treatment of ED is an important step to prevent the consolidation of some personality problems.

In conclusion, impulsive behaviors are very common in those with ED and the coexistence of more than one type of impulsive behavior is not uncommon. Among ED patients, impulsive and multi-impulsive subjects are characterized by the presence of purging behavior and by specific temperamental features such as high levels of novelty seeking and low persistence. The prediction of impulsive behavior is further increased by considering the presence of a history of childhood abuse, the presence of maternal psychiatric morbidity, and some specific psychological symptoms (e.g., maturity fears, perfectionism, anxiety, obsessive-compulsive symptoms). The presence of impulsive behaviors are associated with overall higher levels of psychiatric symptoms and eating pathology, thus indicating that they are important features to be considered in the assessment and treatment of ED.

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