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Why Do Eating Disorders and Obsessive Compulsive Disorder Co-Occur?

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Abstract

The purpose of this study was to use an alternative, dimensionally based approach to understanding the reasons for comorbidity between eating disorders and obsessive compulsive disorder. Participants from a representative community sample ($N=407$; 47% female) completed self-report measures of eating pathology, obsessive-compulsive symptoms, perfectionism, and neuroticism. Hierarchical multiple regression indicated that neuroticism and perfectionism completely mediated associations between most obsessive-compulsive and eating disorder symptoms. However, body dissatisfaction shared unique associations with checking, cleaning, and obsessive rituals that could not be explained by these personality traits. Results suggest that shared personality traits play a key role in the comorbidity between eating disorders characterized by binge eating and dietary restraint and obsessive-compulsive disorder. Future studies are needed to examine whether similar underlying neurocognitive processes that give rise to compulsive checking, cleaning, and obsessive rituals may also contribute to the development and maintenance of body checking in individuals diagnosed with eating disorders.

Keywords

Comorbidity; Eating Disorder; Obsessive Compulsive; Neuroticism; Perfectionism

1. Introduction

The link between eating disorders (EDs) and obsessive-compulsive disorder (OCD) dates back decades (Palmer & Jones, 1939), and was first supported by the observation of common personality traits such as “compulsion neurosis” (Palmer & Jones, 1939) and

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Contributors

The second author served as the principal investigator of the study. The first author wrote the first draft of the manuscript and analyzed the data and the second author assisted with the writing and editing of the manuscript.

Conflict of Interest

All authors declare that they have no conflict of interest.

“compulsive obsessive” (Waller, Kaufman, & Deutsch, 1940). Recent research has consistently identified personality traits that are shared between EDs and OCD, such as perfectionism (Bardone-Cone et al., 2007; Bulik et al., 2003) and neuroticism (Cassin & von Ranson, 2005; Lilenfeld, 2011; Samuels et al., 2000). Given the personality traits shared between eating and obsessive-compulsive disorders, it is not surprising that these disorders tend to co-occur at greater than chance rates, indicating the presence of systematic co-occurrence (Godart, Flament, Perdereau, & Jeammet, 2002; Halmi et al., 2005; Hudson, Hiripi, Pope, & Kessler, 2007; Swinbourne & Touyz, 2007).

Previous work indicates that individuals with comorbid ED and OCD develop the ED at a younger age and experience a more chronic, unremitting course of illness compared to individuals without a co-occurring OCD diagnosis (Carter, Blackmore, Sutandar-Pinnock, & Woodside, 2004; Lo Sauro, Castellini, Lelli, Faravelli, & Ricca, 2012; Milos, Spindler, Ruggiero, Klaghofer, & Schnyder, 2002; Steinhausen, 2002). Understanding the mechanisms that underlie the co-occurrence between these disorders is of critical importance, as it may contribute to a better understanding of clinical course, common etiology, and aid in the development of new treatments designed to target shared underlying mechanisms of dysfunction.

Despite clear documentation of co-occurrence between ED and OCD, few explanatory hypotheses have been proposed. Harvey et al. (2004) and Egan et al. (2011) suggested that a ‘transdiagnostic approach’ to understanding comorbidity may offer a parsimonious explanation for diagnostic co-occurrence. The transdiagnostic approach posits that shared maintaining factors, such as perfectionism, contribute to risk for multiple disorders. However, no previous research has directly tested these hypotheses. In the present study, we used a dimensionally based transdiagnostic approach to understanding the reasons for comorbidity between EDs and OCD. Based on the transdiagnostic model, we hypothesized that neuroticism and perfectionism would mediate the significant correlations between ED and OCD symptoms.

2. Materials and Method

2.1 Participants, procedures, and measures

Participants ($N=407$; 47% female) were community adults recruited to participate in a study designed to develop and validate a new measure of eating pathology (Forbush et al., in press). The mean (SD) age of participants was 38.24 years (13.51). Participants could report more than one race, resulting in the following ethnic/racial groups: Caucasian (89.2%), African American (2.2%), Asian American (6.4%), Hispanic or Latino/a (1.5%), Native-American/Alaskan Native (1.2%), Native-Hawaiian/Pacific Islander (0.5%), and “other” (2.2%). The mean (SD) self-reported body mass index was 26.77 (5.39) for men and 25.95 (6.70) for women. Participants were required to be 18 years old and fluent in English. Exclusion criteria were kept to a minimum to gather data representative of the community. After providing informed consent, participants completed several self-report measures. Procedures were approved by the Institutional Review Board.

2.1.1 Eating Disorder Measures—The Eating Disorders Inventory-3 (EDI-3) (Garner, 2004) is a well-validated measure that consists of 12 scales designed to assess several aspects of ED psychopathology. Only the three ED scales are reported in the present study.

The Eating Disorder Examination Questionnaire (EDE-Q) (Fairburn & Beglin, 1994) consists of 28 items that assess behaviors and attitudes related to EDs through four subscales: Restraint, Eating Concern, Shape Concern, and Weight Concern.

The Three Factor Eating Questionnaire (TFEQ) (Stunkard & Messick, 1985) consists of 51 items that comprise three factors: Cognitive Control of Eating, Dininhibition, and Susceptibility to Hunger.

The Dutch Eating Behaviors Questionnaire¹ (DEBQ) (van Strien, Frijters, Bergers, & Defares, 1986) consists of 33 items that assess restrained eating and binge eating through three scales, including: Restrained Eating, Emotional Eating, and External Eating.

All abovementioned ED measures have been shown to have good to excellent internal consistency in previous studies (Cronbach's alpha ranges from .73 to .95 for ED scales), as well as strong convergent validity and test-retest reliability (Espelage et al., 2003; Mond, Hay, Rodgers, Owen, & Beumont, 2004a, 2004b; Stunkard & Messick, 1985; van Strien et al., 1986).

2.1.2 Obsessive Compulsive Disorder Measure—The Schedule of Compulsions, Obsessions, and Pathological Impulses (SCOPI) (Watson & Wu, 2005) is an empirically derived dimensional measure that consists of 47 items that comprise five symptom dimensions of obsessive-compulsive disorder and related psychopathology, including Obsessive Checking, Obsessive Cleanliness, Compulsive Rituals, Hoarding, and Pathological Impulses. Obsessive Checking assesses recurring and intrusive thoughts, obsessions of doubt, checking, and counting. Obsessive Cleanliness measures concern about germs/contamination. Compulsive Rituals evaluates the need to perform common tasks in a fixed manner. Hoarding assesses behaviors such as collecting items and finding it difficult to throw unnecessary items away. Pathological Impulses assesses impulse-control disorders such as kleptomania and pyromania, and other dysfunctional impulses. The SCOPI has excellent psychometric properties and internal consistency (Watson & Wu, 2005).

2.1.3 Personality Trait Measures—The Big Five Inventory (BFI) (John, Donahue, & Kentle, 1991) measures the five-factor model of personality. The BFI has good internal consistency (Cronbach's alpha = 0.83) and strong convergent validity with the NEO-FFI (John & Srivastava, 1999). Only the Neuroticism scale was used in these analyses.

The Frost Multidimensional Perfectionism Scale (FMPS) (Frost, Marten, Lahart, & Rosenblate, 1990) measures six dimensions of perfectionism. This measure has strong psychometric properties and internal consistency (Cronbach's alpha = 0.88 for the total score) (Frost, Lahart, & Rosenblate, 1991; Parker & Adkins, 1995). Only the total score was used in these analyses.

2.2 Statistical Analysis

Missing data were imputed using SAS version 9.2 (SAS, 2008). Maximum-likelihood multiple imputation was carried out if 15% or less of the total responses for a questionnaire were missing, using 11 imputations per questionnaire. The Statistical Package for Social Science Version 17.0 (SPSS, USA) was used for all other analyses.

To prevent multicollinearity in multiple regression analyses, ED scales with correlations |.70| were combined to create composite ED variables. Hierarchical multiple regression analyses were carried out to determine the strength of associations between symptoms of OCD and ED, after controlling for perfectionism and neuroticism. Separate models were tested in which SCOPI scale scores were entered as independent predictor variables and

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Perfectionism and/or Neuroticism scores were entered as mediating variables. For each model, one of the composite ED variables served as the dependent variable.

3. Results

The mean level of eating pathology reported by participants was consistent with other representative large-scale community-based studies (Mond, Hay, Rodgers, & Owen, 2006; Mond et al., 2004b) (data available upon request from the second author). Based on correlations between ED scales, three composite variables were created: Body Dissatisfaction, Restraint, and Binge Eating (see Table 1).

Prior to controlling for perfectionism and neuroticism (Table 2, Model 1), Checking, Cleaning, and Rituals significantly predicted Body Dissatisfaction. Checking, Cleaning, and Pathological Impulses significantly predicted Restraint (although Pathological Impulses was a negative predictor of Restraint). Checking was the only significant predictor of Binge Eating. The addition of perfectionism (Table 2, Model 2) moderated the association between Cleaning and Body Dissatisfaction and between Checking and Binge Eating. Perfectionism fully mediated the association between Checking, Cleaning, and Restraint. Neuroticism (Table 2, Model 3) independently moderated the association between Checking, Cleaning, and Body Dissatisfaction. Neuroticism was a stronger moderator of these associations than perfectionism. Neuroticism fully mediated the associations between Checking and Binge Eating and between Checking, Cleaning, and Restraint. The inclusion of both perfectionism and neuroticism in Model 4 (Table 2) resulted in greater moderation of the associations between Checking, Cleaning, and Body Dissatisfaction compared to Models 2 and 3; however, the combination of these traits did not mediate these associations. The associations between Checking, Cleaning, and Restraint were fully mediated by neuroticism and perfectionism. The combination of these traits was more potent in accounting for these associations than considering each trait separately. Pathological Impulses remained a significant (negative) predictor of Restraint in all models. Results indicate that neuroticism and perfectionism were acting as suppressor variables, such that the negative relationship between Restraint and Pathological Impulses was strengthened by the inclusion of personality mediator variables.

4. Discussion

This study used a dimensionally based approach to understanding the reasons for comorbidity between EDs and OCD. We hypothesized that perfectionism and neuroticism would mediate the associations between symptoms of OCD and EDs. In support of this hypothesis, neuroticism fully mediated associations between Checking and Binge Eating. Both neuroticism and perfectionism independently mediated associations between Checking, Cleaning, and Restraint. Results suggest that shared personality traits play a key role in the co-occurrence between EDs characterized by binge eating and dietary restraint and OCD, supporting the transdiagnostic model of comorbidity. The combination of neuroticism and perfectionism moderated, but did not mediate, associations between Checking, Cleaning, Rituals, and Body Dissatisfaction. These results suggest that the correlation between body dissatisfaction and key dimensions of OCD cannot be fully explained by personality traits.

Our results extend previous research in several important ways. First, Hasler and colleagues (2005) found that contamination obsessions and cleaning compulsions were related to all EDs. Our results offer the potential explanation that this relationship is explained by the presence of neuroticism and perfectionism acting as underlying mediating (or moderating) variables. Second, given that previous research indicates internalizing disorders are strongly associated with neuroticism-negative emotionality (Krueger, Caspi, Moffitt, & Silva, 1998),

our results lend support to empirical classification models that place eating disorders within the internalizing spectrum (Forbush et al., 2010; Forbush & Watson, in press). Finally, Wu (2008) found that general distress failed to account for the association between compulsive hand washing and BULIT-R total score. Our results suggest these findings may be due to the presence of body dissatisfaction among those who binge and purge, and not bulimic symptoms per se.

While associations between body dissatisfaction and OCD symptoms were moderated by perfectionism and neuroticism, results suggest that personality traits do not fully explain these correlations. Body checking, a behavioral expression of overvaluation of shape and weight, is manifested by recurrent checking behaviors, such as frequent weighing, examination of one's body in mirrors, or active avoidance of viewing oneself. Body checking is similar to behaviors observed in OCD, such as compulsive checking, cleaning, and ritualized compulsions. The association between body dissatisfaction and obsessive-compulsive symptoms may be mediated by similar underlying neurocognitive processes, such as difficulty with set-shifting and central coherence, rather than personality traits. In fact, cognitive remediation strategies designed to improve cognitive flexibility and 'big picture' thinking in individuals with anorexia nervosa have shown initial promise in improving body image (Pretorius et al., 2012; Tchanturia, Davies, & Campbell, 2007). Future studies are needed to examine whether cognitive remediation therapies lead to greater reductions in comorbid OCD symptoms compared to therapies that do not target neurocognitive functioning.

The implications of our results should be considered in the context of the study limitations. First, the study design was cross-sectional and therefore causality cannot be determined. Second, the sample is predominately Caucasian and results cannot be generalized to more ethnically/racially diverse populations. Finally, results cannot be extended to clinical samples of individuals with EDs, who tend to demonstrate greater symptom severity. Nevertheless, the potential effect of analyzing these data in a community sample is that it may have reduced our ability to detect significant associations between variables – a problem that was not observed in the present analyses.

4.1 Conclusions

The results of this study permit a better understanding of mechanisms of co-occurrence between OCD and EDs, indicating that shared neuroticism and perfectionism mediate many of these symptom associations. However, body dissatisfaction had unique associations with obsessive-compulsive symptoms that also contribute to the high rate of comorbidity between these syndromes. These findings have implications for treatment, suggesting that neurocognitive retraining or treatments targeting negative affect-neuroticism may help to improve symptoms of both EDs and OCD. Finally, this study contributes to the growing literature on the location of EDs within an empirical diagnostic taxonomy, supporting their inclusion within a transdiagnostic spectrum of 'internalizing' disorders.

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Highlights

- Personality traits mediated association between binge eating and checking.
- Personality traits mediated association between checking and cleaning.
- Personality moderated association between body dissatisfaction and OCD symptoms.

Pearson's correlations of eating disorder scales

Measure	1	2	3	4	5	6	7	8	9	10	11	12
1. Drive for Thinness ^a	1.000											
2. Bulimia ^a	.634**	1.000										
3. Body Dissatisfaction ^a	.629**	.579**	1.000									
4. Restraint ^b	.569**	.358**	.371**	1.000								
5. Eating Concern ^b	.727**	.735**	.569**	.495**	1.000							
6. Shape Concern ^b	.772**	.624**	.789**	.537**	.721**	1.000						
7. Weight Concern ^b	.791**	.634**	.756**	.585**	.724**	.904**	1.000					
8. Restrained Eating ^c	.581**	.271**	.405**	.710**	.417**	.500**	.547**	1.000				
9. Emotional Eating ^c	.480**	.726**	.533**	.290**	.555**	.558**	.574**	.305**	1.000			
10. External Eating ^c	.332**	.509**	.444**	.201**	.428**	.478**	.455**	.254**	.570**	1.000		
11. Cognitive Restraint ^d	.471**	.110**	.193**	.634**	.283**	.305**	.366**	.765**	.118**	.002	1.000	
12. Disinhibition ^d	.557**	.764**	.610**	.375**	.626**	.642**	.662**	.311**	.762**	.623**	.12**	1.000

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13
13. Susceptibility to Hunger ^d	.327**	.501**	.376**	.213**	.405**	.447**	.453**	.152**	.547**	.576**	—	.674**	1.000

Note. Correlations of [.70] or greater are bolded.

^a Scales of the Eating Disorder Inventory-3 (EDI-3)

^b Scales of Eating Disorder Examination Questionnaire (EDEQ)

^c Scales of the Dutch Eating Behaviors Questionnaire (DEBQ)

^d Scales of the Three-Factor Eating Questionnaire (TFEQ)

* $p < .05$ (2-tailed).

** $p < .01$ (2-tailed)

Table 2

Hierarchical multiple regression of eating disorder and obsessive-compulsive symptoms, controlling for neuroticism and perfectionism

Predictors	Composite ED Variables											
	Body Dissatisfaction						Binge Eating					
	<i>Sβ</i>	<i>t</i>	<i>p</i>	ΔR^2	<i>Sβ</i>	<i>t</i>	<i>p</i>	ΔR^2	<i>Sβ</i>	<i>t</i>	<i>p</i>	ΔR^2
Model 1				.100***				.084***				.048**
Checking	.337	4.728	.000		.280	3.884	.000		.187*	2.548	.011	
Cleaning	.164	2.801	.005		.049	.816	.415		.126*	2.068	.039	
Rituals	—	—	.007		—	—	.175		—	—	.452	
	.178	2.709			.091	1.358			.052	.752		
Hoarding	—	—	.129		—	—	.742		—	—	.143	
	.087	1.522			.019	.329			.086	1.467		
Pathological Impulses	.001	.034	.973		.088	1.618	.106		—	—	.043	
									.112	2.030		
Model 2				.018**				.027*				.015*
Checking	.282	3.902	.000		.224	3.081	.002		.143	1.915	.056	
Cleaning	.147	2.506	.013		.030	.512	.609		.111	1.834	.067	
Rituals	—	—	.003		—	—	.061		—	—	.277	
	.199	2.989			.125	1.876			.074	1.089		
Hoarding	—	—	.302		.007	.128	.899		—	—	.270	
	.059	1.033							.065	1.103		
Pathological Impulses	—	—	.894		.075	1.405	.161		—	—	.028	
	.007	.134							.121	2.206		
Perfectionism	.151	2.803	.005		.186	3.423	.001		.139	2.508	.013	
Model 3				.112***				.152***				.019**
Checking	.163	2.308	.022		.078	1.125	.261		.117	1.516	.130	

Composite ED Variables													
Body Dissatisfaction							Binge Eating						
Predictors	Sβ	t	p	ΔR ²	Sβ	t	p	ΔR ²	Sβ	t	p	ΔR ²	Restraint
Cleaning	.12 2	2.18 4	.03 0		— .00 4	— .065 8	.94 8		.10 7	1.76 8	.07 8		
Rituals	— .17 0	— 2.72 5	.00 7		— .08 1	— 1.31 7	.18 9		— .04 7	— .697 7	.48 7		
Hoarding	— .10 2	— 1.89 1	.05 9		— .03 6	— .676 9	.49 9		— .09 2	— 1.57 7	.11 6		
Pathologic al Impulses	— .02 5	— .494 1	.62 1		.05 8	1.15 6	.24 8		— .12 3	— 2.23 8	.02 6		
Neuroticis m	.39 6	7.47 2	.00 0		.46 2	8.83 0	.00 0		.16 1	2.79 4	.00 5		
Model 4				.004				.007				.009*	
Checking	.14 7	2.06 0	.04 0		.05 8	.821 9	.41 2		.09 3	1.19 9	.23 1		
Cleaning	.11 6	2.07 8	.03 8		— .01 1	—201 1	.84 1		.09 9	1.63 0	.10 4		
Rituals	— .18 4	— 2.92 0	.00 4		— .09 9	— 1.59 9	.11 1		— .06 8	—994 1	.32 1		
Hoarding	— .09 0	— 1.66 3	.09 7		— .02 1	—393 5	.69 5		— .07 5	— 1.27 8	.20 2		
Pathological Impulses	— .02 9	— .574 6	.56 6		.05 2	1.05 3	.29 3		— .12 9	— 2.35 2	.01 9		
Neuroticism	.38 0	7.02 1	.00 0		.44 1	8.27 6	.00 0		.13 7	2.33 6	.02 0		
Perfectionis m	.076	1.457	.146		.098	1.921	.055		.112	1.983	.048		

Note.

*
 $p < .05$

**
 $p < .01$

 $p < .001$

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