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Pathological eating behaviors, BMI, and facet-level traits: The roles of Conscientiousness, Neuroticism, and Impulsivity

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ABSTRACT

The current study examined the bivariate and multivariate associations of personality with Body Mass Index (BMI) and several eating behavior inventories, focusing on facets of Neuroticism, Conscientiousness, and Impulsivity. Simultaneous multiple regressions showed that the facets Traditionalism, Urgency, and low Vulnerability were significant predictors of BMI. A factor analysis of the eating behavior scales revealed two dimensions: (a) Food and Body Preoccupation and (b) Cued Eating; Neuroticism, low Conscientiousness, and Perfectionism were significant predictors of both eating behavior factors. In addition, the Depression facet predicted Food and Body Preoccupation, and low Temperance predicted Cued Eating. Implications are discussed for the structure of eating pathology and the specificity of facet traits to eating behaviors and obesity.

1. Introduction

A sizable literature has examined relations between personality traits and (a) Body Mass Index (BMI) and (b) specific types of eating behaviors (e.g., eating in response to external cues, restricting food intake). Many studies have used the prominent Big Five or five-factor model—which includes the higher order traits of Neuroticism, Extraversion, Conscientiousness, Agreeableness, and Openness to Experience—to assess personality, with a particular focus on the potential role of Neuroticism (positively) and Conscientiousness (negatively) in the development of eating pathology. Unfortunately, these studies have yielded complex and inconsistent results that make it difficult to draw clear, firm conclusions (e.g., Bogg & Roberts, 2004; Brummett et al., 2006; Elfhag & Morey, 2008; Hampson, Goldberg, Vogt, & Dubanoski, 2006; Heaven, Mulligan, Merrilees, Woods, & Fairooz, 2001; Provencher et al., 2008; Rubinstein, 2006; Terracciano et al., 2009).

2. Current study

The current study seeks to clarify the relations of obesity and eating behaviors with personality traits—focusing specifically on Neuroticism and Conscientiousness, which have often yielded moderate but inconsistent effect sizes—by examining facet-level associations within these domains. We include multiple measures of eating behaviors to assess these constructs more fully. Because there is no clear consensus regarding the lower-order level of the Big Five hierarchy, we base our assessment of Neuroticism and Conscientiousness facets on empirical models that cut across different personality inventories. Specifically, we use Roberts, Chernyshenko, Stark, and Goldberg's (2005) six-facet model of Conscientiousness (Industriousness, Order, Self-control, Responsibility, Traditionalism, and Virtue) and Gainey's (2011) six-facet model of Neuroticism (Sadness, Anxiety, Hostility, Mistrust, Dependency, and Vulnerability); in terms of the latter, we also include Maladaptive Perfectionism, given its close association with Neuroticism (Enns & Cox, 1999) and relevance to eating pathology (Pratt, Telch, Labouvie, Wilson, & Agras, 2001; Sherry & Hall, 2009). Finally, two studies have linked eating pathology to individual differences in Impulsivity (Elfhag & Morey, 2008; Heaven et al., 2001); consequently, we also examine the relations between obesity/eating behaviors and specific dimensions of Impulsivity, as conceptualized by the UPPS Impulsive Behavior Scale (Whiteside, Lynam, Miller, & Reynolds, 2005).

In addition to examining bivariate relations among these variables, we report multivariate analyses to clarify which specific personality facets provide unique explanatory power in predicting obesity and eating behaviors. Because women are more likely than men to have an eating disorder and to be classified as overweight or obese (Flegal, Carroll, Ogden, & Curtin, 2010; National Institute of Mental Health [NIMH], 2007), we control for gender in the multivariate analyses.

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3. Method

3.1. Participants and procedure

Participants were 289 University of Iowa students enrolled in Introductory Psychology; they had a mean age of 18.96 years (SD = 1.5), and 59.5% were female. The participants came into the lab and completed measures online in groups of 4–5 people. They received course research credit for their participation. Due to missing data, $N = 286$ for analyses that include Body Mass Index (BMI), $N = 284$ for analyses involving gender, and $N = 282$ for analyses that include both gender and BMI.

3.2. Measures

3.2.1. Personality measures

The personality battery included the Big Five Inventory (BFI; John & Srivastava, 1999), which contains scales assessing Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness; four Neuroticism facets (Depression, Anxiety, Angry Hostility, and Vulnerability) from the Revised NEO Personality Inventory (NEO PI-R; Costa & McCrae, 1992); two scales (Mistrust and Dependency) from the Schedule for Nonadaptive and Adaptive Personality (SNAP; Clark, 1993); the concern over mistakes and doubts about actions scales from the Frost Multidimensional Perfectionism Scale (FMPS; Frost, Marten, Lahart, & Rosenblate, 1990), which were summed to create an overall index of perfectionism; and the UPPS Impulsive Behavior Scale (Whiteside et al., 2005), which assesses four aspects of Impulsivity: Urgency, Lack of Premeditation, Lack of Perseverance, and Sensation Seeking.

In addition, the International Personality Item Pool is a free, public domain "collaboratory" containing items modeled after existing personality instruments (http://ipip.ori.org/ipip/). We selected IPIP scales to model the six Conscientiousness facets identified by Roberts et al. (2005); these facets correspond most highly with IPIP Self-efficacy (modeled after NEO PI-R Competence), IPIP Orderliness (modeled after AB5C Orderliness), IPIP Cautiousness (modeled after NEO PI-R Deliberation), IPIP Responsibility (modeled after California Personality Inventory [CPI] Responsibility), IPIP Conservatism (modeled after Multidimensional Personality Questionnaire [MPQ] Traditionalism), and IPIP Temperance (modeled after CPI Good Impression).

3.2.2. Eating behavior measures

Participants completed three eating pathology measures: (1) the BULIT-R, which measures bulimia symptoms (Thelen, Farmer, Wonderlich, & Smith, 1991); (2) the Dutch Eating Behavior Questionnaire (DEBQ; Van Strien, Frijters, Bergers, & Defares, 1986), which contains scales assessing Emotional Eating, External Eating, and Restrained Eating; and (3) the EAT-26 (Garner, Olmsted, Bohr, & Garfinkel, 1982), which assesses anorexia symptoms.

4. Results

Table 1 displays correlations among BMI and the eating measures. These correlations suggest that the eating behavior scales likely assess common underlying constructs. Therefore, a principal factor analysis was conducted with a promax rotation. We extracted two factors: the first factor was marked by DEBQ Restrained, EAT total, and BULIT-R, whereas the second was marked by DEBQ Emotional and DEBQ External. The first factor is defined by caring deeply about how one's body looks and related concerns about the type and amount of food consumed; it was labeled "Food and Body Preoccupation". The second factor ("Cued Eating") reflects a tendency to eat in response to emotions or environmental cues. The moderate correlation (r = .42) between these factors indicates that they are distinguishable constructs. Regression-based factor scores were calculated and used to assess these dimensions in subsequent analyses.

Table 1
Correlations among eating scales and Body Mass Index.

	DEBQ emotional	DEBQ Restrained	DEBQ external	BULIT-R	EAT-26	Gender
BMI	.02	.21**	−.12	.19**	.04	−.24**
DEBQ emotional		**.37****	**.52****	**.44****	.24**	**.34****
DEBQ restrained			.06	**.57****	**.65****	**.34****
DEBQ external				.29**	.03	.10
BULIT-R					**.64****	.09
EAT-26						.20**

Note. *Total* $N = 289$; $N = 286$ for analyses that include BMI, $N = 284$ for analyses that include gender, and $N = 282$ for analyses that include both gender and BMI. BMI = Body Mass Index; DEBQ = Dutch Eating Behavior Scale; BULIT-R = Bulimia Test Revised; EAT-26 = Eating Attitudes Test-26. Correlations ≥ |.30| are bolded. Gender was coded as 1 = male, 2 = female.
** $p < .01$.

To examine how personality relates to BMI and the eating behaviors, we computed partial correlations, controlling for gender (see Table 2). BMI had a weak to moderate association with Food and Body Preoccupation and a non-significant association with Cued Eating. BMI was not related to personality at the domain level; at the facet level, it correlated only with IPIP Conservatism.

At the domain level, both eating factors were related to Neuroticism, low Conscientiousness, and low Agreeableness; Cued Eating also was weakly related to low Extraversion and low Openness. At the facet level, both eating factors were moderately associated with all of the Neuroticism facets and three Conscientiousness facets (IPIP Self-efficacy, IPIP Temperance, and UPPS Urgency). Food and Body Preoccupation also was related to high IPIP Orderliness and low IPIP Cautiousness, whereas Cued Eating was negatively correlated with IPIP Conservatism, IPIP Responsibility, and UPPS Perseverance.

Table 2 also presents the results of simultaneous multiple regression analyses examining personality traits as predictors. No domains predicted BMI. Whereas this regression accounted for only 8% of the variability of BMI, a second regression using the facets as predictors nearly doubled the proportion of explained variance ($R^2 = .15$): IPIP Conservatism, UPPS Urgency, and low NEO PI-R Vulnerability predicted higher BMI. The significant associations for Urgency and Vulnerability represent suppressor effects, given that these scales both had non-significant partial correlations with BMI.

At the domain level, both Food and Body Preoccupation and Cued Eating were predicted by Neuroticism. Cued Eating also was predicted by low Conscientiousness. Overall, the Big Five domains accounted for 19% (Food and Body Preoccupation) and 20% (Cued Eating) of the variance in these factors; in contrast, the facets accounted for 34% (Food and Body Preoccupation) and 33% (Cued Eating) of the variance, highlighting the utility of examining these associations at the facet level. At the facet level, the two eating behavior factors were predicted by different traits; only the FMPS predicted both factors. Food and Body Preoccupation also was predicted by NEO PI-R Depression and SNAP Dependency, whereas Cued Eating was predicted by low IPIP Temperance.

5. Discussion

We found only one significant personality correlate of BMI (after controlling for gender): a weak positive association with the Conservatism facet, which is related largely to political conservatism or patriotism (e.g., wanting tough laws on crime). At the multivariate level, no personality domain was a significant predictor; however, BMI was predicted by the facets Conservatism, low Vulnerability and high Urgency. These analyses replicate Terracciano et al.'s (2009) finding of no relation at the domain level, while establishing greater predictive power among the facets. Given that a goal of this