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An Examination of Negative Urgency and Other Impulsogenic Traits in Purging Disorder

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Abstract

There is extensive evidence for the clinical significance of Purging Disorder (PD), an eating disorder characterized by recurrent purging behavior (self-induced vomiting, laxative use, and diuretic use) in the absence of binge eating and low weight (Smith, Crowther, & Lavender, 2017). Research on the personality profile of PD is still developing but evidence supports an association with impulsivity (Brown, Haedt-Matt, & Keel, 2011). The personality underpinnings of impulsive behavior include several different impulsogenic traits. To investigate personality contributors to impulsive behavior among women with PD, we compared 31 women with PD to 57 women with bulimia nervosa (BN) and 31 healthy control women on four impulsogenic traits: negative urgency, lack of premeditation, lack of perseverance, and sensation seeking. Compared to healthy controls, women with PD reported significantly greater levels of negative urgency, but no significant differences on the other traits. Compared to BN, PD was associated with significantly lower levels of negative urgency, but no other significant differences. Compared with controls, women in the BN group had significantly higher scores on lack of premeditation and lack of perseverance, but no significant difference on sensation seeking. Findings indicate negative urgency is a potentially important personality trait for distinguishing those with PD.

Keywords

purging disorder; bulimia nervosa; personality; impulsive behaviors; bulimic behaviors

Purging Disorder (PD) represents a clinically significant eating disorder (Keel, Holm-Denoma, & Crosby, 2011; Keel & Striegel-Moore, 2009; Smith, Crowther, & Lavender, 2017) characterized by recurrent purging behavior (i.e., self-induced vomiting, laxative,

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and/or diuretic abuse) to maintain or change weight or shape in the absence of objective binge eating episodes and in the context of normal weight (APA, 2013; Keel, Haedt, & Edler, 2005). PD is therefore distinct from bulimia nervosa (BN) due to the absence of objective binge eating episodes, a core symptom of BN, and from anorexia nervosa (AN) due to the absence of underweight status (APA, 2013). Similar to AN and BN, psychological correlates of PD include body dissatisfaction (Keel et al., 2011) and drive for thinness (Tasca et al., 2011). Purging is associated with medical problems (Forney, Buchman-Schmitt, Keel, & Frank, 2016), and PD is associated with significant psychological distress and impairment (Keel, Wolfe, Gravener, & Jimerson, 2008) similar to that of other diagnosable eating disorders and compared with non-eating disorder controls (see Smith et al., 2017 for a review).

The addition of PD in the DSM-5 as one specific type of Other Specified Feeding or Eating Disorder (OSFED) has spurred increased research on PD (Smith et al., 2017). One important gap in the literature concerns personality trait associations with PD. Because personality traits are present earlier in life than PD (Barbaranelli, Vittorio, Caprara, Rabasca, & Pastorelli, 2003; Roberts & DelVecchio, 2000; Shiner, 1998), it is possible that elevations in high-risk traits contribute to the emergence of PD. An initial step in evaluating this possibility is to determine whether women with PD have elevated levels of high-risk personality traits compared to healthy control women. Based on empirical evidence that PD is associated with impulsivity (Brown, Haedt-Matt, & Keel, 2011; Fink, Smith, Gordon, Holm-Denoma, & Joiner, 2009; Keel et al., 2005; Smith et al., 2017) and theory holding that purging behavior is a rash, impulsive act that alleviates distress (Pearson, Wonderlich, & Smith, 2015), this investigation focused on impulsigenic personality traits. We tested a set of hypotheses derived from a risk model we describe below.

There appear to be several different traits that contribute to impulsive behavior which are only modestly related to each other (Cyders & Smith, 2007; Smith, Fischer, Cyders, Annus, Spillane, & McCarthy, 2007; Whiteside & Lynam, 2001). We examined four such impulsigenic traits: (1) negative urgency, an emotion-based disposition to engage in rash action when distressed; (2) lack of perseverance, the tendency to not follow through on tasks or commitments; (3) lack of premeditation, the tendency to act without forethought; and (4) sensation seeking, a disposition toward thrilling or novel stimulation. These traits differentially predict dysfunctional behaviors and symptoms, both concurrently and prospectively, further supporting the utility in examining them separately (Berg, Latzman, Bliwise, & Lilienfeld, 2015; Smith & Cyders, 2016).

Of these four impulsigenic traits, negative urgency consistently demonstrates the largest correlations and effect sizes in meta-analyses with many forms of impulsive behavior, including eating disorder behaviors, substance use, suicidality, and personality disorder symptoms (Berg et al., 2015; Coskunpinar, Dir, & Cyders, 2013; Fischer, Smith, & Cyders, 2008; Smith & Cyders, 2016). There are empirical reasons to suspect that negative urgency is a particularly important trait with respect to PD. First, there are strong associations between negative urgency and other eating disorders such as BN (Fischer et al., 2008; Fischer, Settles, Collins, Gunn, & Smith, 2012), AN (Culbert et al., 2016), and subthreshold eating disorders (Fischer et al., 2012). Second, negative urgency predicts purging behavior in

nonclinical samples (Fischer, Peterson, & McCarthy, 2012; Pearson & Smith, 2015). Third, though negative urgency has been studied in BN samples, studies also show associations between binge eating behavior, purging behavior, and negative urgency in the AN binge-purge subtype (Culbert et al., 2016; Le Grange et al., 2013), indicating these behaviors outside of BN are still strongly associated with negative urgency. Fourth, negative urgency correlates more strongly with the experience of loss of control during binge eating episodes, rather than amount of food consumed during the episode, for both BN and PD samples (Forney, Bodell, Haedt-Matt, & Keel, 2016; Forney, Haedt-Matt, & Keel, 2014), suggesting that women with PD who engage in loss of control eating may experience elevated levels of negative urgency compared to women who do not engage in loss of control eating.

Theory also points to the potentially important role of negative urgency in PD. Negative urgency represents the specific tendency to react rashly in response to negative emotion in order to relieve distress (Cyders & Smith, 2008). The relationship between negative urgency and purging behavior aligns well with theoretical models which posit individuals engage in binge eating and purging behaviors to reduce negative affect and distress via negative reinforcement (Heatherton & Baumeister, 1991; Pearson et al., 2015). Indeed, self-reported reasons for purging among women with disordered eating include the reduction of negative affect (Wedig & Nock, 2010), and ecological momentary assessment research supports that negative affect decreases after purging in PD (Haedt-Matt & Keel, 2015). Individuals with PD report heightened negative affect compared with healthy controls and comparable to individuals with BN (Keel et al., 2018). Thus, it is possible that individuals with PD engage in purging to help relieve heightened negative affect, perhaps after eating (as shown in laboratory work; Keel et al., 2018) or in general, as not all purging occurs after eating (Keel & Striegel-Moore, 2009).

There are two important limitations of previous work examining impulsogenic traits in PD. First, in previous studies, only negative urgency was examined (Forney et al., 2014; Forney et al., 2016) and not the other impulsogenic traits. Thus, we do not yet know whether negative urgency is more strongly associated with PD than are other impulsogenic traits. Second, there has not yet been an examination of impulsogenic traits in individuals with PD compared to non-eating disorder control individuals, or compared to those with other eating disorders, such as BN. Such comparisons are necessary to determine the value of further investigations of negative urgency and PD.

We compared women with PD to healthy control women without eating disorders and to women with BN on four impulsogenic traits: negative urgency, lack of perseverance, lack of premeditation, and sensation seeking. We tested the following hypotheses. First, individuals with PD would endorse higher levels of negative urgency compared with healthy control participants. Second, the difference in negative urgency between PD and healthy control participants would be greater than the difference between the two groups on any other impulsogenic trait. This hypothesis stems from the theoretical contention that the disposition to engage in rash action to reduce distress, as reflected in negative urgency, plays a central role in purging disorder. Third, although we do not see a basis for forming a strong hypothesis, we investigated whether women with PD would report lower scores on negative urgency than women with BN. We consider this possible because the frequency of

engagement in loss of control eating behavior has been higher in BN samples (Keel, Mayer, & Harnden-Fischer, 2001; Roberto, Grilo, Masheb, & White, 2010) and loss of control eating has been specifically linked with negative urgency both within PD (Forney et al., 2014) and in combined samples of PD and BN participants (Forney et al., 2016), which may confer higher rates of impulsive action and thus greater levels of negative urgency in BN.

We also sought to replicate the finding that women with BN have higher levels of negative urgency than healthy control women (Fischer et al., 2012). We anticipated that the difference in negative urgency between women with BN and healthy control women would be greater than the difference between the two groups on the other traits.

Methods

Participants

Participants come from a larger project examining factors particularly relevant for binge eating versus purging in bulimic syndromes (see Keel et al., 2018). Women ($n = 119$) ages 18 to 45 were recruited from the community for participation in a study that included four study visits over a few weeks. As reported by Keel et al. (2018), participant recruitment and data collection were initiated in Iowa City, Iowa and transferred to Tallahassee, Florida for the remaining four years of the study. Data included here come from the first study visit involving assessment of personality traits (other medical, behavioral, and psychological variables were assessed as well and are reported in Keel et al. (2018)). Participants were recruited to fill three groups: healthy controls ($n = 31$), women with PD ($n = 31$), and women with BN ($n = 57$).

As reported by Keel et al. (2018), participant groups did not differ significantly on age ($F = 0.62$, $p = .54$), BMI ($F = 0.10$, $p = .91$), or ethnic/racial background ($\chi^2 [6] = 5.61$, $p = .47$). Self-reported racial/ethnic diversity of the sample was as follows: 76.5% white, non-Hispanic, 10.9% African American, 6.7% Hispanic, and 5.9% Asian.

IRB approval from the Human Subjects Committee was obtained at both institutions where data were collected, and participants completed informed consent prior to study participation. IRB approval was also obtained at the institution where these secondary analyses occurred.

Measures

Eating Disorders Examination (EDE) interview. The EDE was used to establish eating disorder diagnosis, or healthy control status. The EDE interview has demonstrated interrater reliability for diagnosis (Rosen, Vara, Wendt, & Leitenberg, 1990; Wilson & Smith) and internal consistency for scale scores (Beaumont, Kopec-Schrader, Talbot, & Trouyz, 1993; Cooper, Cooper, & Fairburn, 1989). Prior investigations have also established its validity (Fairburn & Cooper, 1993; Rosen et al., 1990; Wilson & Smith, 1989), including in distinguishing those with eating disorders from healthy controls (Cooper et al., 1989). For the BN group, women were required to meet DSM-5 criteria for BN. For the PD group, women were required to meet research criteria for PD, which mirror those outlined in the DSM-5 with the addition of a specific behavioral symptom frequency of at least once per

week on average and duration of at least three months (Keel & Striegel-Moore, 2009). Women in the control group were required to be free of any type of dietary restriction for the purpose of weight loss within the 8 weeks prior to assessment on the EDE, and could not score above 9 on the Cognitive Restraint Scale of the Three Factor Eating Questionnaire (TFEQ; Stunkard & Messick, 1985), which was administered as part of the full study battery. A detailed description of inclusion and exclusion criteria for all participants and each group is provided in Keel et al. (2018).

UPPS Impulsive Behavior Scale-Revised (UPPS-R; Whiteside & Lynam, 2001). The UPPS-R Impulsive Behavior Scale is a self-report questionnaire used to assess four different impulsogenic personality traits: negative urgency, lack of premeditation, lack of perseverance, and sensation seeking. Items are rated on a 4-point Likert scale ranging from (1) agree strongly to (4) disagree strongly. For each scale, an average of all items is calculated such that higher scores indicate greater levels of the measured trait. In the current sample, internal consistency was good to excellent (negative urgency, $\alpha = .90$, (lack of) premeditation, $\alpha = .83$, (lack of) perseverance, $\alpha = .80$, sensation seeking, $\alpha = .88$).

Procedures

Participants completed the above measures in addition to structured clinical interviews, questionnaires, and medical evaluations as part of the larger project during the 2–3 hour, in-person study visit. Participants were compensated \$75 for completion of this study visit.

Data Analyses

We used a set of mixed design Analysis of Variance (ANOVA) models in which we compared diagnostic groups on the set of four impulsogenic traits. We followed the overall model test with contrasts, in which we compared group differences on negative urgency to group differences on each other trait individually. We report the results of models comparing women with PD to healthy controls and to women with BN, and women with BN to healthy controls. A p -value $< .05$ was used as the threshold for statistical significance testing our hypotheses, and a Bonferroni-adjusted p -value was used to evaluate statistical significance of post-hoc comparisons and minimize Type I error. To facilitate interpretation of comparisons, effect sizes (Cohen's d) were calculated for each significant result. Per Cohen (1992), $d = 0.20$ represents a small effect size, $d = 0.50$ represents a medium effect size, and $d = 0.80$ represents a large effect.

Results

Mean (SD) values of each impulsogenic trait by group are displayed in Table 1. Across groups, there were statistically significant differences in negative urgency ($F(2, 118) = 45.34, p < .001$), lack of premeditation ($F(2, 118) = 3.78, p = .03$), and lack of perseverance scores ($F(2, 118) = 5.18, p = .007$). There were no statistically significant differences across groups on sensation seeking ($p = .97$). Consistent with our hypotheses, post-hoc comparisons revealed that women in the PD group had significantly higher negative urgency scores than healthy controls ($p < .001, d = 1.56$). Women in the PD group did not differ from healthy controls on lack of premeditation ($d = 0.29$), lack of perseverance ($d = 0.26$), or

sensation seeking ($d = 0$) (all $ps > .05$). Most importantly, the difference in negative urgency between women with PD and healthy controls was significantly greater than the difference between these two groups on lack of premeditation ($F(1, 60) = 23.62, p < .001, d = 1.25$), lack of perseverance ($F(1, 60) = 27.94, p < .001, d = 1.37$), and sensation seeking ($F(1, 60) = 12.67, p = .001, d = 0.92$).

Women in the BN group scored higher on negative urgency compared to women in the PD group ($p = .007, d = 0.56$). Women in the BN group did not differ from women in the PD group on lack of premeditation ($d = 0.32$), lack of perseverance ($d = 0.45$), or sensation seeking ($d = 0.04$) (all $ps > .05$). The difference in negative urgency between women in the BN group and women in the PD group was not significantly greater than the difference between these two groups on lack of premeditation ($d = .29$), lack of perseverance ($d = 0.19$), and sensation seeking ($d = 0.35$) (all $ps > .05$).

Compared with healthy controls, women in the BN group scored higher on negative urgency ($p < .001, d = 2.40$). Women in the BN group had significantly higher scores on lack of premeditation ($p = .008, d = 0.62$) and lack of perseverance ($p = .003, d = 0.71$) compared to healthy controls, but did not differ from healthy controls on sensation seeking ($p = 1.00, d = 0.05$). Most importantly, the difference in negative urgency between women with BN and healthy controls was significantly greater than the difference between these two groups on lack of premeditation ($F(1, 86) = 47.94, p < .001, d = 1.49$), lack of perseverance ($F(1, 86) = 42.78, p < .001, d = 1.41$), and sensation seeking ($F(1, 86) = 44.85, p < .001, d = 1.45$).

Discussion

The present study aimed to compare impulsogenic personality trait levels among women with PD to trait levels among healthy control women and women with BN. Results of our model supported our hypothesis that, among impulsogenic traits, negative urgency would relate most strongly to PD. Women with PD had higher rates of negative urgency than did healthy control women, and the difference between the two groups on negative urgency was significantly greater than group differences on any other trait. In fact, we found no evidence that women with PD have higher levels of lack of premeditation, lack of perseverance, and sensation seeking than healthy control women.

Also consistent with hypotheses, women with BN had higher mean levels of negative urgency than did women with PD. A diagnosis of BN requires recurrent engagement in both objective binge eating episodes and compensatory behaviors, both of which may be impulsive acts and both of which are associated with negative urgency (Pearson & Smith, 2015). For that reason, we expected women with BN to have higher scores on negative urgency than women with PD. Further, given that individuals with BN and individuals with binge eating disorder (BED) report similar levels of negative urgency (Wolz, Granero, & Fernandez-Aranda, 2017), it may be that negative urgency is elevated in those with purging (Fischer et al., 2013) and loss of control eating (Forney et al., 2014; 2016), but those with objective binge eating have even higher elevations in negative urgency. Interestingly, though, we found no evidence that the difference between women with BN and women with PD on

negative urgency was greater than the difference between the two groups on any other impulsigenic trait.

As expected, women with BN reported higher levels of negative urgency compared with healthy control women, and the difference between the two groups on negative urgency was significantly greater than group differences on any other impulsigenic trait. This finding served as a successful replication (Fischer et al., 2012) and provides additional support for negative urgency as the most important impulsigenic trait in BN. Results extend this finding by showing that negative urgency also is most useful for distinguishing both BN and PD from the absence of disordered eating.

There are several important implications of the findings related to negative urgency. First, these findings are consistent with the possibility that negative urgency may be a risk factor for the development of clinical eating disorder psychopathology characterized by purging behavior, such as in PD. Previous studies demonstrated elevations in negative urgency predate purging behavior in nonclinical samples (Fischer et al., 2012; Pearson & Smith, 2015). Prospective longitudinal studies of adolescents are necessary to test the hypothesis that negative urgency predicts not only purging behavior, but also PD diagnosis. Related to this, we know that negative urgency is a risk factor for binge eating behavior through longitudinal work (Davis & Smith, 2018; Pearson, Combs, Zapolski, & Smith, 2012). Negative urgency may confer risk for both behaviors because it reflects a general disposition to act rashly when distressed. Indeed, longitudinal work identifies negative urgency as a risk factor for a host of rash behaviors, including problem drinking, smoking, drug use, self-harm, suicidality, and risky sex (Berg et al., 2015; Smith & Cyders, 2016).

Importantly, PD is associated with significant psychiatric comorbidity across studies (Smith et al., 2017). Specifically, individuals with PD have higher rates of suicidality, depression, anxiety, and substance abuse/dependence compared to women without eating disorder symptoms (Brewerton, Dansky, O'Neil, & Kilpatrick, 2003; Smith et al., 2017). It is possible that negative urgency helps account for the overlap between PD and other forms of psychological dysfunction. Negative urgency precedes the onset of purging behavior (Fischer et al., 2012), and PD precedes the development of comorbid anxiety, mood, and substance use disorders in adolescents (Micali et al., 2015). Through its relationship to purging behaviors, negative urgency may operate as a transdiagnostic risk factor for multiple forms of dysfunction.

Interestingly, individuals with PD did not differ from individuals with BN or healthy controls on two other impulsigenic traits studied, lack of premeditation and lack of perseverance. However, individuals with BN reported higher mean levels of these traits compared with healthy controls. The finding that women with BN reported higher levels of these traits compared with healthy controls is surprising, given mixed evidence for the relationship between lack of premeditation, lack of perseverance, and bulimic behaviors (Farstad et al., 2016), with some studies reporting a small but significant association between bulimic symptoms and these traits (Fischer et al., 2008) and others indicating no association (Guller, Zapolski, & Smith, 2015; Peterson et al., 2010). The controls in this study were quite healthy, and did not have any current or past psychiatric problems. It could

be that when compared to such a healthy group, individuals with BN differed on these traits. These findings merit replication.

There are several methodological strengths to this study, such as the recruitment of clinical groups meeting DSM-5 criteria for BN and OSFED PD, and absence of current mood or substance use disorders, the use of an impulsogenic trait measure with excellent psychometric properties, and samples that were well-matched on potential confounds, including age and BMI.

It is important to note the limitations of the present study. Due to the cross-sectional nature of these data, we cannot make temporal or causal inferences regarding impulsogenic correlates of PD. Longitudinal designs may help in evaluating negative urgency's impact, in particular, on the development and maintenance of PD. Because the original, larger study did not include participants with AN and BED, we were not able to compare PD to those with AN and BED, and therefore cannot evaluate how PD compares with all eating disorder diagnoses on impulsogenic traits. Future investigations may choose to compare PD samples to other eating disorder samples to evaluate impulsogenic traits across diagnoses. Next, though differences between BN and PD were not significant for lack of perseverance and lack of premeditation, effect sizes of these comparisons were small to medium, suggesting our small clinical samples may have been underpowered to detect an effect. Future research should seek to replicate these results with larger clinical sample sizes. Finally, we conceptualize negative urgency as a risk factor for both purging and subjective binge eating in PD, but due to small clinical sample sizes, our study did not permit an examination of whether negative urgency is more strongly related to purging or loss of control eating in PD. Previous studies of negative urgency's relationship with purging are mixed; Forney et al. (2014) did not find an association between negative urgency and purging behavior frequency in a sample of women with PD, but elevations in negative urgency did predict purging behavior frequency longitudinally in a college student sample (Fischer et al., 2013) and a sample of adolescents (Pearson & Smith, 2015). Negative urgency does appear to be associated with loss of control eating in PD (Forney et al. (2014) and in combined samples of PD and BN (Forney et al., 2016). Future studies may seek to clarify whether elevations in negative urgency in PD compared with controls specifically reflects differences in loss of control eating behavior, purging behavior, or both.

These findings contribute to an accumulating literature on the personality profile of PD. The impulsogenic trait most associated with PD is negative urgency, a transdiagnostic personality trait associated with multiple harms. Future studies should seek to clarify exactly how negative urgency operates in PD to inform prevention and intervention efforts.

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Highlights

- Negative urgency (NU) differentiates women with eating disorders and healthy control women.
- Women with purging disorder report higher levels of NU than healthy control women.
- Women with bulimia nervosa report higher levels of NU than women with purging disorder.

Table 1.

Comparison of groups on impulsogenic traits

	Control (<i>n</i> = 31)		PD (<i>n</i> = 31)		BN (<i>n</i> = 57)		<i>F</i> (2, 116)	<i>p</i>
	<i>M</i> (<i>SD</i>)		<i>M</i> (<i>SD</i>)		<i>M</i> (<i>SD</i>)			
Negative Urgency	1.67 (0.36) ^a		2.45 (0.61) ^b		2.77 (0.54) ^c		45.34	< .001
Lack of Premeditation	1.88 (0.37) ^a		2.00 (0.45) ^{a, b}		2.15 (0.48) ^b		3.78	.026
Lack of Perseverance	1.64 (0.34) ^a		1.74 (0.43) ^{a, b}		1.95 (0.51) ^b		5.18	.007
Sensation Seeking	2.95 (0.55)		2.95 (0.73)		2.98 (0.67)		0.03	.971

Note. PD = Purging Disorder, BN = Bulimia Nervosa. Note: Superscripts that differ represent significant differences of $p < .016$ between groups.