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RELATIONSHIPS AMONG MALADAPTIVE COGNITIVE CONTENT, DYSFUNCTIONAL COGNITIVE PROCESSES, AND BORDERLINE PERSONALITY FEATURES

Paul J. Geiger, MS, Jessica R. Peters, BS,
Shannon E. Sauer-Zavala, PhD, and Ruth A. Baer, PhD

Previous research has demonstrated that maladaptive cognitive content, including dysfunctional attitudes and negative automatic thoughts, is associated with emotional distress. Similarly, dysfunctional cognitive processes, including thought suppression and rumination, have been shown to intensify psychological difficulties. Although maladaptive cognitive content and dysfunctional processes have been linked to borderline personality disorder (BPD), most research has been conducted with Axis I disorders. This study examined the incremental validity of dysfunctional cognitive content and processes in predicting BPD symptom severity, controlling for trait negative affect, in a sample of undergraduate students (N = 85), including many with high levels of BPD features. Although nearly all variables were significantly correlated with BPD features, final regression models suggest that rumination and thought suppression are stronger independent predictors of BPD features than automatic thoughts, dysfunctional attitudes, and trait negative affect. These results suggest the importance of targeting thought suppression and rumination in BPD.

Borderline personality disorder (BPD) is a severe condition characterized by intense negative affect, unstable interpersonal relationships, and impulsive behavior. High levels of trait neuroticism are associated with BPD (Lynam & Widiger, 2001). Neuroticism is typically defined as a biologically based tendency to experience frequent and strong negative emotions in response to various sources of stress (Clark, 2005). Although there is considerable overlap between dimensions of normal personality and personality disorders, additional variance in these disorders remains unexplained. In BPD, high levels of neuroticism are believed to interact with the effects of an invalidating or traumatic childhood environment (Linehan, 1993) to create emotional instability, problematic relationships, and

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From University of Kentucky (P. J. G., J. R. P., R. A. B.); and Boston University (S. E. S.-Z.).

Address correspondence to Paul J. Geiger, Department of Psychology, University of Kentucky, Lexington, KY 40502; E-mail: paulgeiger10@gmail.com

other borderline pathology. Although trait-level characteristics and childhood events can be addressed in therapy, recent research on emotional dysfunction suggests that ongoing cognitive and emotional processes may be more amenable to change and should also be targeted to improve treatment outcomes (Beck, 2005).

One such factor is distorted beliefs and perceptions about oneself and the world. Although this negative cognitive content has been studied most extensively in Axis I disorders (Beck, 2005), extensions to Axis II suggest that distorted attitudes and beliefs are also common in BPD. Pretzer (1990) proposed that three core beliefs underlie borderline pathology: the world and other people are dangerous and malevolent, the self is powerless and vulnerable, and the self is inherently unacceptable. Young, Klosko, and Weishaar (2003) describe schema modes with similar themes. Negative cognitive content is problematic, because such thoughts and beliefs appear to play a central role in the etiology and maintenance of many emotional disorders (Beck, 2005).

Distinct from cognitive content (beliefs, schemas, attitudes), dysfunctional cognitive processes may also be important in the development and maintenance of BPD. Such processes include thought suppression and rumination, which have been shown to exacerbate psychological symptoms across a variety of diagnostic categories (Abramowitz, Tolin, & Street, 2001; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Thought suppression is an avoidant coping strategy in which unpleasant, emotion-inducing cognitions are pushed out of awareness; paradoxically, it appears to produce rebound effects in which the suppressed thoughts return with greater frequency and intensity (Wegner, Schneider, Carter, & White, 1987). Rumination, defined as repetitively and passively focusing on negative mood and its possible causes, meanings, and consequences (Nolen-Hoeksema, 1991), is also conceptualized as an avoidant strategy, because passive self-focus in an abstract or analytic style may serve to protect individuals from more distressing memories and concerns (Williams, 2006). Both rumination and thought suppression are associated with the severity of BPD features (Baer & Sauer, 2011; Rosenthal, Cheavens, Lejuez, & Lynch, 2005). This is consistent with the notion that individuals with BPD are fearful of emotions and attempt to avoid such experiences (Chapman, Gratz, & Brown, 2006; Linehan, 1993).

Although both maladaptive cognitive content and dysfunctional cognitive processes have been linked to the severity of BPD, the relative contributions of these constructs have not been investigated, particularly when controlling for the trait-level tendency to experience negative affect. Recent studies in student and clinical samples have demonstrated that depression and anxiety symptoms are more strongly related to how one manages negative internal experiences when they occur than to the frequency of such experiences (Sauer & Baer, 2009; Sauer-Zavala et al., 2012). The present study extended these findings to BPD by examining the incremental validity of maladaptive cognitive content (automatic thoughts

and dysfunctional attitudes) and dysfunctional cognitive processes (thought suppression and rumination) over trait-level negative affect in predicting severity of BPD features. We hypothesized that measures of maladaptive cognitive content and dysfunctional cognitive processes would be positively correlated with trait negative affect and BPD features, and that cognitive content and processes would both account for significant variance in BPD features after controlling for trait negative affect.

METHOD

PARTICIPANTS AND PROCEDURE

Participants were 85 students (83.5% female, 87% White) at the University of Kentucky who completed a packet of self-report measures, only some of which were relevant to the present study (see Measures). Their mean age was 18.79 years (*SD* = 1.83, range 18–33). The study was available to all students in a departmental participant pool. To ensure that a broad range of BPD symptoms were represented in the sample, e-mail invitations to participate in the study were sent to students obtaining high or low scores (*T* scores above 70 or below 50) on a screening measure of BPD features. Due to this oversampling procedure, 29% of the sample had scores in the clinically significant range. Recruitment details and previous findings for this sample have been reported by Baer and Sauer (2011); however, analyses of relationships between cognitive content and process have not been reported. All participants provided informed consent and received course credit for participation. Previous research has shown large effect sizes for relationships among rumination, thought suppression, and borderline features (Baer & Sauer, 2011; Chapman, Specht, & Cellucci, 2005), and between dysfunctional attitudes and borderline features (O'Leary et al., 1991). Power analysis revealed that 85 participants provide adequate power to detect a small-to-medium effect size ($f^2 = .1$, $\alpha = .05$, $1\text{-}\beta = .82$).

MEASURES

Cognitive Content. The Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980) and the Dysfunctional Attitudes Scale (DAS; Weissman & Beck, 1978) were used to assess cognitive content. The ATQ has 30 items assessing frequency of negative automatic thoughts, such as "I'm a failure" and "I hate myself." Although the ATQ was designed to assess thoughts common in depression, Hill, Oei, and Hill (1989) found that participants with substance use and personality disorders (including BPD) obtained comparably elevated scores. The DAS is a 40-item measure of dysfunctional attitudes, such as "I should be upset if I make a mistake." The DAS was designed to assess beliefs characteristic of depression; however, O'Leary et al. (1991) reported that scores were equally elevated in patients with BPD, regardless of current or past depressive episodes. Alphas for all measures are presented in Table 1.

TABLE 1. Bivariate Correlations and Internal Consistencies for Borderline Personality Features Scores,Trait Negative Affect Scores, Measures of Maladaptive Cognitive Content, and Measures of Dysfunctional Cognitive Processes (*N* = 85)

	1	2	3	4	5	6	7	8	9	10
1. PAI-BOR AI	(*.86*)									
2. PAI-BOR IP	.67*	(*.70*)								
3. PAI-BOR NR	.70*	.70*	(*.79*)							
4. PAI-BOR SH	.55*	.42*	.36*	(*.70*)						
5. NA	.63*	.54*	.56*	.44*	(*.85*)					
6. DAS	.29*	.44*	.43*	.10	.39*	(*.84*)				
7. ATQ	.58*	.71*	.57*	.48*	.73*	.42*	(*.97*)			
8. ARS	.73*	.72*	.72*	.52*	.61*	.44*	.71*	(*.95*)		
9. RSQ	.53*	.52*	.49*	.35*	.52*	.30*	.53*	.59*	(*.90*)	
10. WBSI	.57*	.64*	.71*	.31*	.53*	.34*	.62*	.64*	.56*	(*.90*)

Note. *$p < .05$; internal consistencies for scales presented on the diagonal.
Borderline Personality Features (PAI-BOR) scales: AI = Affect Intensity; IP = Interpersonal Problems; NR = Negative Relationships; SH = Self Harm; NA = Trait Negative Affectivity; Cognitive Content scales: DAS = Dysfunctional Attributions Scale, ATQ = Automatic Thoughts Questionnaire; Cognitive Process scales: ARS = Anger Rumination, RSQ = Depressive Rumination, WBSI = Thought Suppression.

Cognitive Processes. Depressive rumination was assessed with the Ruminative Responses Scale (RRS; Nolen-Hoeksema & Morrow, 1991). It has 22 items assessing the tendency to ruminate when feeling sad, blue, or depressed. Items include, "[I think], why can't I get going?" and "What am I doing to deserve this?" Anger rumination was assessed with the Anger Rumination Scale (ARS; Sukhodolsky, Golub, & Cromwell, 2001), a 19-item measure of the proclivity to think repetitively about angry moods and anger-inducing situations (e.g., "When something makes me angry, I turn this matter over and over in my mind"). Thought suppression was measured using the White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994), a 15-item measure of the tendency to try to keep unwanted thoughts out of mind.

Borderline Features. The Personality Assessment Inventory—Borderline Features Scale (PAI-BOR; Morey, 1991) includes 24 items and provides subscale scores for four core features of BPD: self-harm, difficult relationships, identity problems, and affective instability. The PAI-BOR is widely used and has shown excellent psychometric properties (Morey, 1991).

Trait Negative Affect. The Positive Affect Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) includes 20 mood adjectives: 10 for positive affect (e.g., *happy*) and 10 for negative affect (e.g., *irritated*). To provide a trait-level indication of negative affect, participants rated how often they *generally* feel each of these items. Only the negative affect score was included in the present study.

RESULTS

The data were screened for outliers and one participant's data were excluded because of scores that were out of range (over five *SD*s above the mean on the ARS), reducing the sample size to 85. Our first hypothesis

was that all measures of dysfunctional cognitive content and cognitive processes would be significantly associated with borderline features. This hypothesis was largely supported. As seen in Table 1, PAI-BOR scores were significantly correlated with all other variables, except that Self-Harm was not significantly correlated with the DAS.

Our second hypothesis was that dysfunctional cognitive content and processes would account for significant variance in borderline features after controlling for trait negative affect. This hypothesis was tested with four hierarchical linear regression analyses, one for each of the PAI-BOR subscales. Findings are shown in Table 2. In each analysis, trait negative affect was entered in Step 1, dysfunctional cognitive content (automatic thoughts and dysfunctional attitudes) in Step 2, and maladaptive cognitive processes (depressive rumination, anger rumination, thought suppression) in Step 3. Although cognitive variables were significantly intercorrelated, multicollinearity was not problematic, with all VIF values under 3.0. In the first analysis, trait negative affect was a significant pre-

TABLE 2. Summaries of Regression Analyses Predicting PAI-BOR Subscales from Measures of Trait NegativeAffect, Dysfunction Cognitive Content, and Maladaptive Cognitive Processes (N = 85)

Dependent Variable	Step	Predictors	ΔR^2	Total R^2	Final β
Affect instability	1	trait negative affect	.40**	.40**	.31**
	2	cognitive content	.03	.43**	
		automatic thoughts			−.07
		dysfunctional attitudes			−.08
	3	cognitive processes	.17**	.60**	
		depressive rumination			.07
		anger rumination			.51**
		thought suppression			.10
Identity problems	1	trait negative affect	.29**	.29**	−.08
	2	cognitive content	.24**	.53**	
		automatic thoughts			.35**
		dysfunctional attitudes			.10
	3	cognitive processes	.11**	.64**	
		depressive rumination			.05
		anger rumination			.33**
		thought suppression			.20*
Negative relationships	1	trait negative affect	.31**	.31**	.13
	2	cognitive content	.09**	.40**	
		automatic thoughts			−.10
		dysfunctional attitudes			.11
	3	cognitive processes	.24**	.64**	
		depressive rumination			−.03
		anger rumination			.41**
		thought suppression			.42**
Self harm	1	trait negative affect	.20**	.20**	.15
	2	cognitive content	.07**	.27**	
		automatic thoughts			.22
		dysfunctional attitudes			−.20
	3	cognitive processes	.08**	.35**	
		depressive rumination			.04
		anger rumination			.43**
		thought suppression			−.14

Note. beta weights are those obtained in the final step of each analysis.
*p < .05, **p < .01.

dictor of affective instability. The addition of automatic thoughts and dysfunctional attitudes to the model at Step 2 led to a nonsignificant increase in R^2. At Step 3, with the addition of the two rumination variables and thought suppression, R^2 increased significantly. In the final model, only trait negative affect and anger rumination were significant predictors of affective instability. Analyses for the remaining PAI-BOR subscales showed similar though not identical patterns. In each case, R^2 increased significantly at each step. In the final model for identity problems, automatic thoughts, anger rumination, and thought suppression were significant independent predictors, whereas for negative relationships, only anger rumination and thought suppression were significant predictors, and for self-harm, anger rumination was the only significant predictor.

DISCUSSION

Maladaptive cognitive content and dysfunctional cognitive processes have well-established relationships with Axis I disorders, and previous literature suggests that these variables are also related to BPD symptom severity. The present study contributes to this literature by showing that measures of maladaptive cognitive content and dysfunctional cognitive processes were significant predictors of BPD features after controlling for trait negative affect. The final regression models suggested that rumination and thought suppression may be stronger independent predictors of BPD features than automatic thoughts and dysfunctional attitudes. The most consistent and robust predictor of BPD features was anger rumination, which accounted for significant variance in all four of the PAI-BOR subscales after controlling for all other variables. Dysfunctional anger is an important diagnostic criterion for BPD, and previous work on the rejection-rage contingency shows that perceived rejection is a trigger for extreme anger in BPD (Berenson, Downey, Rafaeli, Coifman, & Paquin, 2011). Ruminating about perceived rejection and other anger-inducing experiences may contribute to the severity of a range of BPD features.

After controlling for cognitive content and processes, we found that trait negative affect was a significant independent predictor only for the *affective instability* subscale of the PAI-BOR. This finding may be related to the overlap between trait-level negative affect as conceptualized by the PANAS and affective instability as operationalized by the PAI-BOR. Overall, however, these findings may be encouraging from a treatment perspective. A large literature on Axis I disorders shows that dysfunctional cognitions can be modified through cognitive restructuring (Beck, 2005) and that rumination and thought suppression can be reduced through mindfulness training (Hayes & Feldman, 2004). The present findings suggest that reductions in rumination and thought suppression may be helpful for people with high levels of BPD features. Although existing treatments for BPD include procedures that may accomplish this goal (Linehan, 1993), their specific effects on rumination and thought suppression have not been studied.

Several limitations of the present study must be noted. All assessment relied on self-report methods. Although the measures used here have strong psychometric properties, this study should be replicated with diagnostic interviews to assess BPD features and behavioral tasks for other variables. Alternative self-report measures also should be examined. In particular, the Young Schema Questionnaire (Young, 2003) assesses schemas central to BPD (Young et al., 2003) and therefore may capture the distorted cognitions of BPD more clearly than the measures used here. Another limitation is the use of a student sample. Although we oversampled for high levels of BPD features using the PAI-BOR, which has been shown to detect clinically significant BPD features in student samples, findings should be replicated in a clinical population meeting criteria for BPD.

Despite these limitations, the present study contributes to the literature on cognitive processes in BPD by suggesting the importance of rumination and thought suppression in accounting for severity of BPD symptoms, even after controlling for trait negative affect and distorted cognitive content. Findings are consistent with previous work in suggesting that many psychological symptoms are more strongly influenced by malleable cognitive processes than by high trait levels of negative affect. They also suggest that maladaptive cognitive processes deserve increased attention in research on the psychopathology of BPD.

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