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Borderline Personality Disorder Symptoms and Aggression: A Within-Person Process Model

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Abstract

Theoretical and empirical work suggests that aggression in those with borderline personality disorder (BPD) occurs primarily in the context of emotional reactivity, especially anger and shame, in response to perceived rejection. Using intensive repeated measures, we examined a within-person process model in which perceived rejection predicts increases in aggressive urges and behaviors via increases in negative affect (indirect effect) and in which BPD symptoms exacerbate this process (moderated mediation). Participants were 117 emerging adult women (ages 18–24) with recent histories of aggressive behavior who were recruited from a community-based longitudinal study of at-risk youth. Personality disorder symptoms were assessed by semi-structured clinical interview, and aggressive urges, threats, and behaviors were measured in daily life during a three-week ecological momentary assessment (EMA) protocol. Multilevel path models revealed that within-person increases in perceived rejection predicted increases in negative affect, especially in women with greater BPD symptoms. In turn, increases in negative affect predicted increased likelihood of aggressive urges or behaviors. Further analysis revealed that BPD symptoms predicted greater anger and shame reactivity to perceived rejection, but not to criticism or insult. Additionally, only anger was associated with increases in aggression after controlling for other negative emotions. Whereas BPD symptoms exacerbated the link between perceived rejection and aggression via increases in negative affect (particularly anger), this process was attenuated in women with greater antisocial personality disorder (ASPD) symptoms. These findings suggest that anger reactivity to perceived rejection is one unique pathway, distinct from ASPD, by which BPD symptoms increase risk for aggression.

Keywords

borderline personality disorder; aggression; ecological momentary assessment; anger; shame

Aggression, defined as behavior intended to harm another person emotionally, socially, or physically, is among the most functionally debilitating, clinically challenging, and poorly

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understood aspects of borderline personality disorder (BPD). In both men and women, BPD has been associated with heightened risk for the perpetration of both direct and indirect forms of aggression, including physical assault, psychological and relational aggression, domestic violence, and property damage (Newhill, Eack, & Mulvey, 2012; Sansone & Sansone, 2012). Even in its mildest forms, aggressive behavior is disruptive to personal relationships, educational and career pursuits, and therapeutic progress, and it contributes to both stigma and treatment barriers associated with BPD. Nonetheless, relatively little research has been devoted to understanding the mechanisms that lead to aggression within real-world settings, and how these processes are influenced by BPD symptoms. Understanding the contextual and emotional antecedents that predict the occurrence and maintenance of aggression in these individuals may help to reduce negative stereotypes of personality disorder patients and lead to the development of targeted interventions to reduce aggressive behavior.

Recent findings suggest that affective dysregulation serves as one important mechanism that enhances risk for aggression in those with BPD (Mancke, Bertsch, & Herpertz, 2015; Newhill et al., 2012; Scott, Stepp, & Pilkonis, 2014). However, the specific form and context of this dysregulation remains poorly understood. In addition, it is still unclear whether aggression in BPD is mediated by different processes than near-neighbor personality disorders, particularly antisocial personality disorder (ASPD). Although BPD and ASPD share some temperamental characteristics such as impulsivity and irritability, there are core aspects of BPD that may predict aggression and that do not necessarily overlap with ASPD, including affective instability (Paris, Chenard-Poirier, & Biskin, 2012), hypersensitivity to interpersonal threats (Gunderson & Lyons-Ruth, 2008; Mancke, Herpertz, & Bertsch, 2015), and shame proneness (Schoenleber & Berenbaum, 2012a). Such relationally and affectively based processes may constitute important clinical targets for interventions to reduce aggression in those with prominent BPD symptoms.

Perceived Rejection, Negative Affect, and Aggression

Some processes that evoke aggression among non-clinical and non-criminal samples in the aggression literature appear similar to the affective and interpersonal hypersensitivity of BPD. Based on these studies, one general pathway to aggression is via negative emotional reactivity in response to perceived interpersonal rejection, ostracism, or criticism (Ayduk, Downey, Testa, Yen, & Shoda, 1999; Tangney, Wagner, Fletcher, & Gramzow, 1992). Social rejection or criticism has been demonstrated to evoke not only anger, but also shame, a painful self-conscious emotion characterized by feeling inferior, devalued, humiliated, and defective (Tangney & Dearing, 2002). Although shame often motivates the desire to withdraw, hide, or inflict self harm, this painful emotion can also be redirected outward, leading to “humiliated fury” (Lewis, 1971; Tangney et al., 1992). Hence, even among non-BPD samples, researchers have delineated a pathway in which feeling rejected or criticized leads to increases in both shame and anger, which in turn, are associated with aggression.

Rejection Sensitivity and Borderline Personality Disorder

The association between experienced interpersonal rejection and aggression is even stronger among individuals who are high in rejection sensitivity, i.e., the dispositional tendency to anxiously expect and readily perceive rejection (Ayduk et al., 1999). A number of studies demonstrate that individuals with BPD score high on measures of rejection sensitivity and have a tendency to perceive and react strongly to rejection-related cues (Berenson, Downey, Rafiaeli, Coifman, & Paquin, 2011; Renneberg et al., 2012; Staebler, Helbing, Rosenbach, & Renneberg, 2011; Tragesser, Lippman, Trull, & Barrett, 2008). Further, one study revealed greater left cortical activation in women with BPD in response to social exclusion (Beeney, Levy, Gatzke-Kopp, & Hallquist, 2014), which is consistent with approach-oriented behaviors such as hostility and aggression. In experience sampling or diary studies, participants with BPD report more anger in response to perceived rejection and cold or quarrelsome behavior in daily life (Berenson et al., 2011; Sadikaj, Russell, Moskowitz, & Paris, 2010). Another study reported greater quarrelsome behavior in participants with BPD in response to perceived cold behavior from others, which was partially explained by heightened negative emotional reactivity in these encounters (Sadikaj, Moskowitz, Russell, Zuroff, & Paris, 2013). The only experience sampling study to assess aggressive behavior specifically (as opposed to related constructs such as rage or quarrelsomeness) in relation to BPD used a weekly diary design with undergraduate students. The authors found that the association between BPD symptoms and aggression was mediated by negative interpersonal events such as rejection (Herr, Keenan-Miller, Rosenthal, & Feldblum, 2013).

Although most studies on interpersonal difficulties in BPD have focused on general negative affect or anger, there is evidence suggesting that individuals with BPD may be particularly prone to shame and “humiliated fury” in the context of social rejection. Several theorists and researchers have discussed shame as a core experience in BPD (Crowe, 2004; Rizvi, Brown, Bohus, & Linehan, 2011). Studies demonstrate associations between BPD and shame-proneness (Rusch et al., 2007) as well as shame aversion, indicating that shame is experienced as particularly painful in those with elevated BPD features (Schoenleber & Berenbaum, 2012a). A few studies show that individuals with prominent BPD symptoms respond to negative evaluation or social rejection with increased shame (Chapman, Walters, & Gordon, 2014; Gratz, Rosenthal, Tull, Lejuez, & Gunderson, 2010), and one investigation found that those with BPD responded to a laboratory shame induction with more anger (Scheel et al., 2013). Because shame is so painful to those with BPD, there may be increased motivation to avoid or deflect shame through strategies such as externalized aggression (Schoenleber & Berenbaum, 2012b). Accordingly, shame has been associated with anger and hostility among individuals with BPD or elevated BPD features (Peters & Geiger, 2016; Scheel et al., 2013; Scott et al., 2015), but associations between shame and actual aggressive behavior in those with BPD are unclear.

Together, these findings suggest that individuals with BPD or elevated BPD symptoms may show stronger negative emotional reactivity, particularly anger and shame, in response to perceived rejection. Once these negative emotions are activated, difficulties regulating emotions and impulses in the context of heightened arousal may predispose those with BPD to aggressive responses. Thus, BPD symptoms might exacerbate the processes previously

observed in non-clinical populations in which social rejection provokes increases in negative affect (especially anger and shame), which in turn, predict increases in aggression. However, evidence is mixed regarding whether those with BPD are also sensitive to general provocations such as negative evaluation, criticism, or insult, or if their interpersonal sensitivity is specific to attachment-based threats involving rejection or abandonment, which involves the threatened or real loss of a potentially important relationship. Consistent with the attachment anxiety and fears of abandonment often observed in BPD (e.g., Levy, 2005; Scott et al., 2013) and with findings from laboratory tasks in non-clinical samples with BPD features (Chapman, Dixon-Gordon, Butler, & Walters, 2015; Chapman et al., 2014), individuals with prominent BPD symptoms might be especially emotionally reactive to perceived rejection or abandonment. On the other hand, anger and aggression in response to criticism or insult may be a more general and normative process that occurs regardless of BPD or other personality pathology.

Aims and Hypotheses of the Current Study

In the effort to identify with whom, when, and how best to intervene to prevent aggressive behavior and its consequences, it is necessary to focus on elucidating the proximal within-person processes that increase risk for aggression in situ. Ecological momentary assessment (EMA) methods and the intensive repeated measures they provide are ideally suited for examining dynamic within-individual processes that unfold over short intervals (i.e., minutes to hours). In the current study, we used EMA to examine the dynamic intraindividual processes underlying aggression in the daily lives of an at-risk community sample of emerging adult women (ages 18–24) who reported a history of aggressive behavior. Whereas most previous EMA studies have focused on emotional outcomes (e.g., affective instability or specific emotions such as rage) and not actual aggressive *behavior*, a novel and important aspect of the current study was the comprehensive assessment of aggressive urges and behaviors, including both direct (e.g., verbal, physical) and indirect (i.e., relational) forms, over the course of three weeks with multiple daily assessments. We also assessed and statistically controlled for experiences of victimization (i.e., perceived threats or being a victim of emotional or physical harm), a predictor of aggressive behavior, especially within intimate relationships (Straus, 2010).

Another unique aspect of the current study is the at-risk community sample of emerging adult women with a wide range of BPD and ASPD symptoms and a history of aggressive behavior. Although there is a need to study the processes underlying aggression in both men and women with BPD, prior research suggests gender differences in the forms, functions, and underlying mechanisms of aggression (Mancke, Bertsch, et al., 2015; Odgers, Reppucci, & Moretti, 2005). In addition, despite evidence that women perpetrate intimate partner violence at rates that match or exceed those of men (Archer, 2000; Stuart et al., 2006), research on female aggression still lags far behind that for males, and the unique treatment needs of females who exhibit these behaviors (with or without BPD) remain poorly understood (Snethen & Van Puymbroeck, 2008). Furthermore, this at-risk community sample identified on the basis of aggression includes women with a wide range of ASPD symptoms, which tend to be less common in clinical samples (Zimmerman, Chelminski, &

Young, 2008). This allowed us to control for ASPD symptoms in an effort to distinguish the effects of BPD features that do not overlap with those of ASPD.

Our primary aims were 1) to examine negative emotional reactivity to perceived interpersonal rejection as within-person processes leading to momentary increases in aggressive urges and behaviors; and 2) to examine BPD symptoms as a between-person factor that might exacerbate these within-individual processes. Our hypothesized conceptual model for the current study is illustrated in Figure 1. Based on evidence of associations between perceived rejection, shame, anger, and aggression (Ayduk et al., 1999; Murray-Close & Rellini, 2012; Romero-Canyas, Downey, Berenson, Ayduk, & Kang, 2010; Tangney et al., 1992), we predicted:

1. *The within-person association between perceived rejection and subsequent likelihood of aggression would be mediated by increases in negative affect, especially anger and shame.*

In addition, based on previous studies suggesting heightened negative emotional reactivity to rejection in those with BPD or elevated BPD symptoms (Berenson et al., 2011; Chapman, Dixon-Gordon, Butler, & Walters, 2015; Chapman et al., 2014), we hypothesized that this indirect within-person effect would be intensified among women with greater BPD symptoms after controlling for overlapping ASPD symptoms. Specifically, as depicted in Figure 1, we predicted:

2. *BPD symptoms (and not ASPD symptoms) would amplify the within-person associations between perceived rejection and increases in negative affect, especially anger and shame (“a” paths).*
3. *BPD symptoms (and not ASPD symptoms) would amplify the within-person associations between negative affect, especially anger and shame, and subsequent likelihood of aggression (“b” paths).*

Although we had no specific predictions regarding moderation of the direct association between rejection and aggression after controlling for negative affects (*c’ path*), we explored individual variation in this parameter as well as potential moderation of this effect by BPD and ASPD symptoms. Finally, we tested the limits of these effects by examining whether the same within-person processes and moderation effects emerged if rejection were replaced with perceived criticism in each model (i.e., *Criticism* → *Affect* → *Aggression*). Based on theory and prior studies reviewed above, we expected that BPD symptoms would only amplify the effect of rejection (and not the effect of criticism) on aggression via negative affect.

Method

Participants and Recruitment Procedures

Participants were recruited from the ongoing Pittsburgh Girls Study (PGS) for a substudy on young women’s personality features and impulsive aggression. The PGS has accrued an urban community sample of 2,450 girls who were identified by oversampling from neighborhoods in which at least 25% of families were living at or below poverty level (see

Keenan et al., 2010 for further details on PGS recruitment and study design). PGS participants were ages 5–8 at the first assessment in 2000/2001 and have been followed with annual assessments since that time. Participants over the age of 18 in the larger PGS at high risk for impulsive aggression were identified for the current substudy using a two-stage process. In the first stage, participants who reported verbal, physical, or relational aggression or self-harm/suicidality within the past year were identified via items administered annually in the PGS assessment battery over the course of three years (2014–2016). Women who were identified in the first stage were then contacted by telephone for further screening to ascertain whether they had engaged in externalized aggressive behavior in the past month (e.g., yelling/screaming, insulting or calling someone names, hitting or punching someone, threatening to beat someone up, etc.). Women who endorsed any of these behaviors in the past month were invited to participate in the current substudy. This process resulted in the recruitment of 118 women who completed study procedures involved in this report (i.e., clinical interviews and at least one week of the 21-day EMA protocol). One participant who reported an unusually high number of aggressive episodes (> 9 *SDs* above the mean) during the EMA protocol was excluded from analyses, for a final sample of 117 participants. Participants ranged in age from 18 to 24 years old ($M = 20.58$, $SD = 1.46$). Consistent with the demographic characteristics of the PGS, the sample was racially and socioeconomically diverse (70.1% African American, 28.2% Caucasian, 1.7% multi-racial; 1% identified as Hispanic; 45.3% reported receiving public assistance). Eleven percent did not complete high school, 44% completed high school or GED only, and 38% were unemployed. Nineteen percent of participants had at least one child.

Assessment Procedures and Measures

Participants completed semi-structured diagnostic interviews and self-report measures in the laboratory, followed by a three-week web-based EMA protocol using touch screen smart phones. All study procedures were approved by the University of Pittsburgh Institutional Review Board (Protocol Number PRO13050549). Participants were compensated for their participation.

Personality Disorder Symptoms—BPD and other personality disorder symptoms were assessed dimensionally using the Structured Clinical Interview for DSM-IV Personality Disorders (SIDP-IV; Pfohl, Blum, & Zimmerman, 1997). Interviewers were post-baccalaureate, masters, or doctoral-level clinicians who were trained by the first author. The items corresponding to individual *DSM-5* diagnostic criteria for each personality disorder were rated on a 0–3 scale (0 = *not present*, 1 = *subthreshold*, 2 = *present*, 3 = *strongly present*). Dimensional scores for BPD and ASPD severity, calculated as the sum of scores for the BPD and ASPD criteria, respectively, were used as continuous predictors in the primary analyses. A randomly selected subsample ($n = 29$; 25%) of SIDP-IV interviews were videotaped and rated by an independent clinical judge for calculation of interrater reliability. ICC's were calculated based on one-way random effect models, and they demonstrated adequate interrater agreement for BPD and ASPD dimensional scores (ICC's = .90 and .79, respectively). The distribution of BPD and ASPD symptoms above clinical threshold (i.e., rated *present* or *strongly present* on the SIDP-IV) is presented in Table 1.

Almost half (44%) of the sample had clinically significant BPD symptoms (i.e., 3 or more above threshold (Clifton & Pilkonis, 2007)).

Ecological Momentary Assessment—After completion of diagnostic interviews, participants were trained to use a smart phone on which they completed a three-week web-based EMA protocol consisting of two types of assessments: 1) a daily morning assessment, and 2) six daily random prompts. Moods were assessed at all assessments (morning and random), and aggressive behaviors and other interpersonal experiences were assessed only at random prompts. Prompts for assessments were sent via text message with a link to a secure web server where participants could log on to complete each survey using a unique password. Based on each participants' reported typical wake-up and bed times, the first daily prompt was sent within 15 minutes of their usual wake-up time, and their waking hours were divided into 6 bins with random prompts occurring at randomly generated times within each bin. If a participant did not complete a scheduled assessment within 5 minutes of the first prompt, second and third text message reminders were sent, each at 5-minute intervals. The window for completion of a given assessment expired when the next scheduled prompt was sent except for the last daily assessment, the window for which did not close until 3:00am. If an assessment was not completed by the time the assessment window closed or the next prompt was sent, that assessment was counted as missing. Each completed assessment was automatically saved to the database on a secure server and marked with the date and time of completion.

Data were checked regularly by research staff for the purpose of ongoing risk assessment and compliance monitoring. Participants were paid up to \$175 over the course of the 3-week period, with full payment contingent on completing at least 85% of prompted assessments. Payment was prorated for those who completed less than 85% of entries. In most cases, individuals could complete 21 days of assessments with a maximum of 147 possible entries (with the exception of one participant who completed 150 entries over the course of 23 days due to technical error). The mean number of completed entries per person was $M = 112.28$ ($SD = 31.99$; $Median = 125$; $Range = 24-150$). Hence, the mean and median compliance rates (considering a maximum of 147 possible entries) were 76% and 85%, respectively. Because we were interested in processes as they unfold within individuals over time, we excluded any time-lagged variables from analysis that were less than 15 minutes or greater than 24 hours apart (2.9% of observations). A total of 12,759 observations were analyzed, which included 10,987 random assessments of aggressive urges and behaviors. The average time lag between included assessments was 4.01 hours ($SD = 4.72$; $Median = 2.10$; $Mode = 1.60$). Participants were asked at each assessment to report their location, who they were with, and what they were doing in the last 15 minutes. On the majority of occasions, participants reported being in a home environment (either their own or someone else's home, 66%), with at least one other person (68%), and socializing, talking on the phone or texting, and/or being online or on social media (46%).

Moods: At each assessment (both morning and random prompts), participants were asked to rate on 5-point Likert scales (1 = *not at all*, 5 = *extremely*) the extent to which they experienced different moods "in the past 15 minutes". Items to assess general negative

affective states as well as anger and shame specifically were drawn from established measures of mood including the Positive and Negative Affect Schedule – Extended version (PANAS-X; Watson & Clark, 1999), Positive and Negative Affect Schedule for Children (PANAS-C; Laurent et al., 1999), and the Personal Feelings Questionnaire (Harder & Lewis, 1987). Mood scales for general and specific negative affects were created by calculating the mean of subsets of items for each person at each measurement occasion. For each scale, between- and within-person reliability estimates were calculated using methods described by Cranford and colleagues (2006). The between-persons reliability coefficient describes the reliability of between-person differences averaged over items and time, and the within-person coefficient describes with reliability of change within individuals over time. The scales used, their corresponding items, and between- and within-person reliability estimates for each scale were: General Negative Affect (GNA; ashamed, guilty, hostile, irritable, scared, sad, lonely; .98 and .71); Anger (hostile, irritable, angry at others, annoyed, mad; .98 and .85); and Shame (ashamed, stupid, embarrassed, disgusted with myself, deserving of criticism, regretful; .98 and .83). In analyses examining specific affects (Anger or Shame) as mediators, we controlled for the influence of GNA by creating alternate versions of the GNA scale comprised only of items that were not included in calculation of the specific affect being examined.

Perceived Rejection and Criticism: At each random assessment (up to 6 times daily), participants were asked to rate two items on 5-point Likert scales (1= *not at all*, 5 = *extremely*) indicating the extent to which they had felt “rejected, abandoned, excluded, or left out” and “insulted or criticized” since the last entry. We examined scores on each of these items separately in order to discriminate between rejection and criticism in pathways to aggression.

Aggressive Urges and Behaviors: At every random assessment, participants were asked to rate six items on 5-point Likert scales (1= *not at all*, 5 = *extremely*) to indicate the extent to which they had experienced urges, made threats, or took actions to harm anyone socially, emotionally, or physically “since the last prompt” (see Supplementary Materials for specific items and rates of endorsement). If any of these items were rated > 1 on any occasion, specific aggressive actions and their targets were then assessed using dichotomous item checklists (participants could check all that applied). Aggressive urges, threats, or behaviors were reported by 66.7% of the sample at least once during the three weeks of assessments. The majority of reported aggressive behaviors were directed at others within close relationships (romantic partner or ex-partner: 48%; family member, friend, or roommate: 39%). As expected, aggressive urges and behaviors occurred relatively infrequently at the observation level, occurring in only 2.1% of observations. Although we explored zero-inflated and two-part distribution models to examine aggression outcomes continuously, the power to detect moderation and mediation effects in the continuous (non-zero) parts of these models was limited with so few non-zero observations, and we encountered difficulties with model convergence in all but the simplest of models. Therefore, we examined aggression as a binary outcome, coded as 1 if any aggressive urge or behavior (either physical or non-physical) was endorsed at all on a given occasion and 0 if no aggressive urge or behavior was endorsed. Demonstrating the construct validity of this measure, multilevel logistic

regression indicated that participants who scored higher at study intake on the Aggression Questionnaire (Buss & Perry, 1992), an established measure of aggressive tendencies, had significantly greater odds of aggressive urges or behaviors during the EMA protocol ($p = .001$).

Victimization: At each random assessment, participants were asked to rate three items describing experiences of being threatened or harmed socially, emotionally, or physically “since the last prompt” on 5-point Likert scales (1 = *not at all*, 5 = *extremely*). Items rated > 1 were followed with dichotomous item checklists of specific victimization experiences and perpetrators (see Supplemental Materials). Approximately one quarter of the sample (24.8%) reported at least one instance of emotional or physical victimization during the assessment period, most frequently by a romantic partner or ex-partner (approximately 50% of reported events). Because victimization was reported infrequently (in only 0.5% of observations), we created a dichotomous victimization variable, coded as 1 if any experience of being threatened or harmed was endorsed on a given occasion, and 0 if no threat or harm was reported.

Analytic Procedures—Hypotheses were tested using multilevel path analysis in Mplus version 7 (Muthén & Muthén, 2012) using full-information maximum likelihood estimation with robust standard errors (MLR estimator) and Monte Carlo integration. We conducted a total of three mediation analyses to individually examine three different affect scales as possible mediators of the association between perceived rejection and the likelihood of aggression: 1) general NA as mediator; 2) Anger as mediator after controlling for general NA (excluding overlapping anger items); and 3) Shame as mediator after controlling for general NA (excluding overlapping shame items). In all models, the binary aggression outcome was “categorical”, for which Mplus uses a Bernoulli response distribution and a logit link function. Because we were interested only in mediation at the within-person level, we used a traditional “unconflated” multilevel modeling strategy in which we parsed the rejection and negative affect predictors into within- and between-individual components. The within-individual components were person-mean-centered repeated measures of rejection and negative affect scales, representing momentary deviations around one’s own mean on these measures. We controlled for the influence of between-individual components, which were grand-mean-centered person means of rejection and negative affect scales. We used the “model constraint” command in Mplus to calculate indirect effects based on the product of component path coefficients at the within-person level only. Standard errors and 95% confidence intervals for indirect effects were calculated using the delta method (MacKinnon, 2008). To index the size of significant indirect effects, we computed the amount of variance (i.e., R^2) in the dependent variable explained by the mediator (i.e., indirect effect divided by total effect). We probed significant cross-level interactions by calculating indirect and total effects at selected values of the moderators that were represented in the sample.

In constructing the longitudinal mediation models, we paid special attention to the timing and wording of assessments in order to specify a model in which temporal precedence of (a) rejection to increases in negative affect and of (b) negative affect to increases in aggression

could be established or at least be considered likely, while also being able to capture the temporal scale on which these processes are most likely to unfold. Perceived rejection and aggressive urges and behaviors were assessed “since the last prompt” (i.e., at any time during an assessment interval), and moods were assessed “in the last 15 minutes” (i.e., at the end of an assessment interval). Because we expected the rejection-related increase in negative affect to occur either immediately or very shortly after perceived rejection, we examined within-person fluctuations (relative to one’s own mean levels) in perceived rejection at time $t-1$ as a predictor of residualized change in within-person increases in negative affect assessed at the end of $t-1$ after controlling for negative affect at the end of $t-2$. In turn, we examined within-person increases in negative affect at $t-1$ as a predictor of increases in the likelihood of aggressive urges and behaviors at the next interval, time t , after controlling for aggression at $t-1$. This time-lagged within-person model is illustrated in Figure 2.¹

We followed the same model building and trimming steps for each mediation model in accordance with recommended practices (e.g., see Nezlek, 2012). Although standard model fit tests and indices (e.g., chi-square, RMSEA, CFI) are not currently available in models involving random slopes, the relative model fit can be compared using information theoretic fit indices (e.g., the Bayesian Information Criterion; BIC). In the first step, we estimated the full within-person mediation model without specifying any moderators, which included randomly varying direct paths a , b , and c' as well as autoregressive effects $ar1$ and $ar2$ (see Figure 2). Although the initial models with all five random slopes converged, they returned errors suggesting that the parameter estimates and standard errors might not be fully trustworthy. In the next steps, we fixed any non-significant variances of these slopes to zero one at a time (beginning with the smallest variance estimates), re-estimated the model, and examined whether the change resulted in a reduced BIC, indicating better model fit. This step was repeated if any additional random slopes had non-significant variance or if there were errors in model estimation. After arriving at a final within-person mediation model (i.e., without estimation errors, variance components reliably estimated and significant, and lowest BIC value), we then specified both BPD and ASPD symptoms simultaneously as moderators of a , b , and c' paths. Although our hypotheses centered on BPD severity as a moderator of the within-person process and not ASPD, we examined both simultaneously as moderators in order to determine the unique effects of BPD severity after controlling for features of another personality disorder with shared characteristics (e.g., aggression and impulsivity). Finally, to ensure a stable solution and accuracy of indirect effects (which can be influenced by extraneous cross-level moderation parameters that are unnecessary to the model), we followed the same model trimming principles outlined above, i.e., non-significant cross-level moderation effects were removed one at a time, the model was re-estimated, and BIC values were compared in a stepwise manner until a final model with no estimation errors and the lowest BIC value was achieved. For the Anger and Shame mediation models, we also controlled for GNA at time $t-1$ (adjusted for overlapping items)

¹Although our choice to examine rejection at $t-1$ rather than $t-2$ as a predictor of increases in negative affect at the end of $t-1$ leaves some uncertainty regarding the order in which rejection and changes in affect occurred, this choice was driven by the expected time scale on which these processes are most likely to occur. If rejection occurred during any particular assessment window then an increase in negative affect in relation to that instance of rejection is most likely to occur immediately (i.e., during the same interval) rather than in the next time interval, which on average would be about four hours later.

as a fixed effect at the within-person level. The random intercept of aggression was also regressed on BPD and ASPD symptoms, as well as person-level means of rejection and affect scales.

Results

Preliminary Analysis

To select covariates, we computed a series of multilevel models to examine the influence of potential confounding variables on likelihood of aggressive urges and behaviors. Variables assessed in this step at the within-persons level included “Time” (person-mean-centered amount of time elapsed since the first entry), “Lag time” (person-mean centered amount of time elapsed since the last entry), victimization (assessed dichotomously at both time t and $t-1$), and weekday/weekend effects (0 = *Monday-Thursday*, 1 = *Friday-Sunday*), and variables assessed at the between-persons level included minority race or ethnicity (0 = *White and Non-Hispanic*, 1 = *African American, Multi-racial, or Hispanic/Latina*), low socioeconomic status (0 = *not receiving public assistance*, 1 = *receiving public assistance*), compliance (number of entries completed), and participant age. Each potential covariate was first tested individually, and those that reached statistical significance were then combined into a single model to examine their significance in the multivariate context. Time and compliance were significantly associated with lower likelihood of aggression, and victimization at time t and age were associated with higher likelihood of aggression. Therefore, these variables were retained as covariates, along with ASPD symptoms as a planned covariate, in the subsequent models. Sample statistics for all variables used in the analyses as well as intraclass correlation coefficients for repeated measures are presented in Table 2. Correlations between person-level (i.e., aggregated) study variables are presented in Supplementary Table S2.

Before testing the full mediation models, we first examined the direct effect of within-person fluctuations in perceived rejection at time $t-1$ on increases in the likelihood of aggression at time t after controlling for aggression at $t-1$ and other covariates (time, victimization, age, compliance, BPD and ASPD symptoms, and mean levels of perceived rejection) without including any affect variables as covariates or mediators. Results (see Supplementary Table S3) demonstrated that within-individual increases in perceived rejection at $t-1$ significantly predicted increases in the likelihood of aggression at t ($B = 0.32$, $SE = 0.13$, $p = .01$). Both BPD ($B = 0.06$, $SE = 0.02$, $p = .02$) and ASPD ($B = 0.06$, $SE = 0.02$, $p = .02$) severity scores were also significantly associated with greater likelihood of aggression.

Having established a direct association between rejection and increases in aggression, we then examined our hypothesized moderated mediation models. A summary of within-person direct and indirect effects from the final multilevel mediation models at mean levels of BPD and ASPD symptoms is presented in Table 3, and indirect and total effects at varying levels of BPD and ASPD symptoms are presented in Table 4. Full model results are provided in Supplementary Tables S4–S7.

Moderated Mediation Model 1: General Negative Affect (GNA) as Mediator

In the final model with GNA mediating the relationship between rejection and aggression, paths a and $ar1$ were specified as random and had significant variance (all p 's < .001). Results demonstrated that within-person increases in perceived rejection at $t-1$ predicted increases in GNA from $t-2$ to $t-1$ (path a). In turn, GNA at $t-1$ predicted increases in the likelihood of aggression at t (path b). The indirect relationship between perceived rejection and aggression via increases in GNA was significant. However, the direct relation between rejection and aggression (path c') was non-significant after accounting for increases in GNA. Thus, the relationship between within-person increases in perceived rejection and subsequent likelihood of aggression was fully mediated by increases in GNA, which explained 27.4% of the total effect.

Further, both BPD and ASPD symptoms moderated path a , but in opposite directions, such that the association between within-person increases in rejection and increases in GNA was strengthened in women with greater BPD symptoms ($B = 0.01$, $SE = 0.003$, $p < .001$), and attenuated in women with greater ASPD symptoms ($B = -0.01$, $SE = 0.004$, $p = .003$).² Neither paths b or c' were significantly moderated by either BPD or ASPD symptoms, and removing these non-significant cross-level interaction effects resulted in a reduced BIC and error-free convergence, suggesting improved model fit and reliability of parameter estimates. As shown in Table 4, the indirect effect via increases in GNA was not significant ($p > .05$) at low levels of BPD symptoms ($-1SD$) or at high levels of ASPD symptoms ($+2SD$).

Moderated Mediation Model 2: Anger as Mediator

In the final model with Anger mediating the relationship between rejection and aggression after controlling for GNA (removing overlapping anger items), paths a and $ar1$ were specified as random and had significant variance (p 's < .001). Results demonstrated that within-person increases in perceived rejection at $t-1$ predicted increases in Anger from $t-2$ to $t-1$ (path a). In turn, Anger at $t-1$ predicted increases in the likelihood of aggression at t (path b). The indirect relationship between perceived rejection and aggression via increases in Anger was significant, and the direct relation between rejection and aggression (path c') was still marginally significant ($p = .046$) after accounting for increases in Anger. Thus, the relationship between within-person increases in perceived rejection and subsequent likelihood of aggression was partially mediated by increases in Anger, which explained 34.4% of the total effect.

In addition, BPD symptoms moderated path a in Model 2 as well, such that the association between within-person increases in rejection and increases in Anger was strengthened in women with greater BPD symptoms ($B = 0.02$, $SE = 0.01$, $p = .01$). This path was also marginally attenuated by ASPD symptoms after controlling for the effect of BPD symptoms ($B = -0.02$, $SE = 0.01$, $p = .05$). Neither BPD nor ASPD moderated the b or c' paths, and removing these cross-level effects resulted in a reduced BIC and error-free convergence. As

²Given the significant correlation between BPD and ASPD symptoms ($r = .44$, $p < .001$), we tested for possible suppression effects by re-estimating the final moderated mediation models with each variable alone as a moderator without controlling for the other. In all cases, the direction of moderation effects of BPD (+) and ASPD (-) remained the same as in the full model controlling for both at the same time.

shown in Table 4, the indirect effect via Anger remained significant at all levels of BPD and ASPD symptoms except among those with very high levels of ASPD severity (+3*SD*).

Moderated Mediation Model 3: Shame as Mediator

In the final model with Shame mediating the relationship between rejection and aggression after controlling for GNA (removing the overlapping shame item), paths *a* and *ar1* were specified as random and had significant variance (p 's < .001). Results demonstrated that within-person increases in perceived rejection at *t-1* predicted increases in Shame from *t-2* to *t-1* (path *a*). However, unlike in Models 1 or 2, Shame at *t-1* did not predict increases in the likelihood of aggression at *t* (path *b*) after controlling for GNA. The indirect relationship between perceived rejection and aggression via increases in Shame was not statistically significant, nor was the direct relation between rejection and aggression (path *c*') significant after accounting for increases in Shame as well as GNA. BPD severity moderated path *a*, indicating that the association between within-person increases in rejection and increases in Shame was strengthened in women with greater BPD symptoms ($B = 0.01$, $SE = 0.003$, $p = .001$). The negative effect of ASPD symptoms on path *a* approached but did not reach significance ($B = -0.006$, $SE = 0.003$, $p = .055$). Neither BPD nor ASPD moderated the *b* or *c*' paths, and removal of these cross-level effects resulted in improved model fit. As shown in Table 4, the indirect effect via increases in Shame was non-significant at every level of BPD or ASPD symptoms.

Supplemental Analyses: Perceived Criticism → Affect → Aggression

We tested the limits of the above effects by replacing rejection with perceived criticism in each final moderated mediation model (see Supplemental Table S7 for a summary of results). Within-person mediation results were highly consistent with those reported above for the rejection models, but there was no significant cross-level moderation of these within-individual effects by BPD symptoms. In other words, the association between perceived criticism and aggression was mediated by increases in negative affect, and specifically by increases in anger (and not by shame), but these effects did not vary as a function of BPD severity.

Discussion

Using EMA methods in an at-risk community sample of emerging adult women, we sought to examine a moderated mediation model in which BPD symptoms exacerbate the pathway from perceived rejection to aggressive urges and behaviors via increases in negative affect. We also examined anger and shame as specific negative affects driving this within-individual process from perceived rejection to aggression. As hypothesized, results demonstrated that within-individual increases in perceived rejection predicted increases in general negative affect (GNA), which in turn, predicted greater likelihood of subsequent increases in aggressive urges or behaviors. Also, partially consistent with hypotheses, BPD symptoms uniquely exacerbated this within-individual process via one specific pathway, i.e., women with greater BPD symptoms showed stronger increases in GNA at times when they reported feeling more rejected than usual. Once GNA was activated, however, those with greater BPD symptoms were no more likely to engage in aggressive behavior than those with low BPD

symptoms. Importantly, opposite effects were found for women with greater ASPD symptoms, who demonstrated less GNA in the context of rejection after controlling for BPD symptoms. In supplemental analyses, we tested the limits of these findings by replacing rejection with perceived criticism, and found that although perceived criticism also predicted increases in GNA, which in turn, predicted greater aggression, this process was not amplified by BPD severity. These results extend prior findings of emotional hypersensitivity to rejection in those with BPD (Berenson et al., 2011; Chapman et al., 2015; Chapman et al., 2014; Gratz et al., 2010), suggesting that increased negative emotional reactivity in the context of rejection, but not criticism, is a potential mechanism underlying women's aggression that is intensified by BPD symptoms after accounting for comorbid ASPD symptoms.

With regard to the specific affects driving this process, hypotheses were partially supported by results demonstrating that increases in anger, but not shame, predicted subsequent increases in the likelihood of aggression, independent of BPD or ASPD symptoms. Although within-person increases in perceived rejection predicted increases in both anger and shame, and more so in women with greater BPD features, only anger was proximally associated with increased likelihood of subsequent aggression after controlling for other negative emotions. These findings are noteworthy in contrast to correlations at the bivariate between-persons level (see Supplementary Table S2) in which average levels of shame were positively correlated with aggression, highlighting distinctions between cross-sectional associations and dynamic within-persons processes that unfold over time. Thus, consistent with prior cross-sectional research (Bennett, Sullivan, & Lewis, 2005; Ferguson, Stegge, Miller, & Olsen, 1999; Tangney et al., 1992; Tangney, Wagner, Hill-Barlow, Marschall, & Gramzow, 1996), individual differences in shame-proneness were associated with aggression-proneness. However, our findings expand on these prior results to suggest that momentary increases in shame may not be a proximal mechanism for near-term increases in aggressive behavior, especially after taking into account concurrent increases in anger. The supplemental analyses replacing rejection with criticism also expand on prior findings by suggesting that individuals with prominent BPD symptoms show greater anger and shame reactivity to perceived rejection, but not criticism. These results suggest that anger and shame in response to criticism may be a normative intraindividual process that is not accentuated by BPD symptoms.

These findings also highlight the important distinction between emotional experiences, such as anger, and actual aggression, which involves urges or behaviors to intentionally harm others. Despite evidence that shame is related to anger and hostility among individuals with BPD or elevated BPD symptoms (Peters & Geiger, 2016; Rusch et al., 2007; Scheel et al., 2013; Scott et al., 2015), the current findings suggest that shame does not uniquely and directly increase the risk for momentary increases in aggressive urges or behaviors above and beyond other negative emotions, particularly anger. It is possible that anger is associated with more approach-oriented tendencies whereas shame is more associated with avoidance or even self-harm-related behaviors after controlling for anger. It is also plausible that when anger and shame co-occur and lead to aggression, anger is more accessible and available to conscious awareness whereas shame is more difficult to assess via self report. A related possibility is that shame is indirectly related to aggression via anger or a related process.

Prior research suggests that shame-proneness is related to aggression indirectly via externalization of blame (Stuewig, Tangney, Heigel, Harty, & McCloskey, 2010). However, these dynamic processes may be simultaneous or occur on a timescale that would require even more intensive assessment to reveal (i.e., many observations only minutes apart).

This is the first study to our knowledge that has assessed aggressive urges and behaviors intensively with multiple daily assessments in a sample with a wide range of personality disorder features. This is also the first study to demonstrate negative emotional reactivity, and anger reactivity in particular, as a mediator of the longitudinal association between experiences of interpersonal rejection and subsequent increases in aggression at the momentary level. There are both strengths and limitations in our approach. On the one hand, we assessed many types of aggression, including indirect and non-physical forms that are relevant for female samples, and aggression questions were worded to capture intent to harm others rather than merely emotional or cognitive experiences such as anger and hostility. On the other hand, urges and behaviors to intentionally cause harm to others occur at low base rates, and may be subject to underreporting due to impression management biases. Given the infrequency of aggression reports, we were forced to combine and dichotomize aggression outcomes into a single variable, which does not allow us to distinguish between aggressive urges and behaviors, different types of aggression, or activation versus intensity of aggression. In addition, despite the increased ecological validity of EMA methods over retrospective reports, the current study still relies on participants' ability to accurately report their emotional and interpersonal experiences. Furthermore, our results may not generalize to men or treatment-seeking individuals with higher rates of BPD diagnosis.

Nonetheless, this work represents a significant advance in elucidating intraindividual and contextual mechanisms underlying aggression in women with BPD features by demonstrating that increases in negative affect, and specifically anger, at least partially mediate the within-person association between perceived rejection and subsequent aggression in daily life, particularly in women with elevated BPD symptoms. Moreover, these results suggest that BPD symptoms accentuate negative emotional reactivity specifically in attachment-relevant contexts characterized by rejection, exclusion, or abandonment, but not in the context of more general provocations such as criticism or insult. These findings build on previous work suggesting that affective dysregulation (Mancke, Bertsch, et al., 2015; Newhill et al., 2012; Scott et al., 2014) and interpersonal threat hypersensitivity (Mancke, Herpertz, et al., 2015), especially in response to rejection, are key processes that enhance risk for aggression in those with BPD. Furthermore, our results suggest that these affective and interpersonal mechanisms set apart BPD and ASPD-related aggression, at least after controlling for features shared across these disorders. However, the regions of significance of indirect effects at varying levels of BPD and ASPD symptoms suggest that anger reactivity in the context of perceived rejection is a general within-individual pathway to aggression in at-risk women that is not specific to those with BPD, but is merely amplified by increasing severity of BPD symptoms. Interpersonal hypersensitivity to rejection-related cues may be an important clinical target in interventions with aggressive young women in general, but may be particularly effective with those who have significant BPD symptoms. In contrast, other processes not examined in the current study may be more relevant clinical targets for women with significant ASPD features and low BPD symptoms.

Our findings support continued study of unique and common pathways to aggressive behavior in those with BPD and other psychiatric disorders using naturalistic methods such as EMA.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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General Scientific Summary

This study suggests that anger in the context of perceived rejection, but not in response to criticism, are key processes that enhance risk for aggressive urges and behaviors in daily life among women with prominent borderline personality disorder symptoms.

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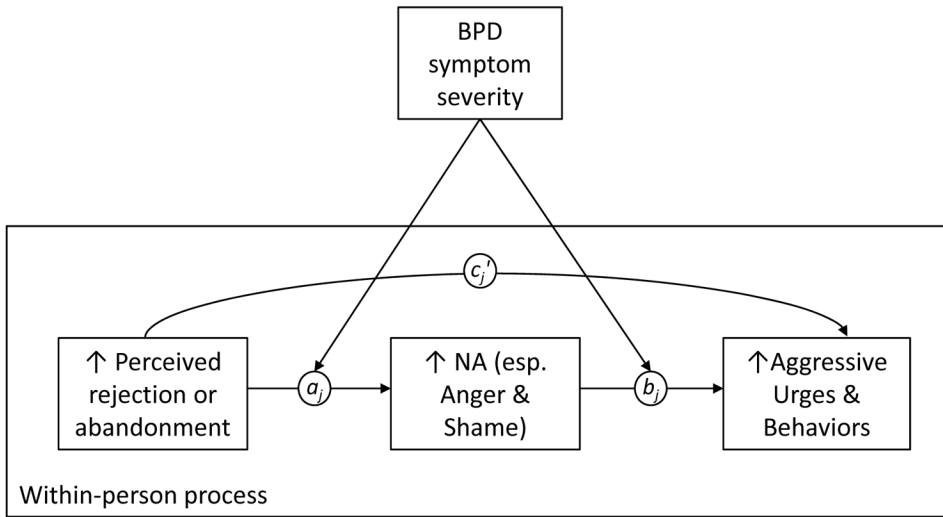


Figure 1. Conceptual model depicting hypothesized within-individual pathway (for individual j) from perceived rejection to aggression via increases in negative affect (NA), and specifically via anger and shame. Borderline personality disorder (BPD) symptom severity is hypothesized to accentuate this within-individual pathway by amplifying (*i.e.*, moderating) paths a_j and/or b_j . Hypothesized mediators (general NA, and specific affects, anger and shame) were each examined in separate models.

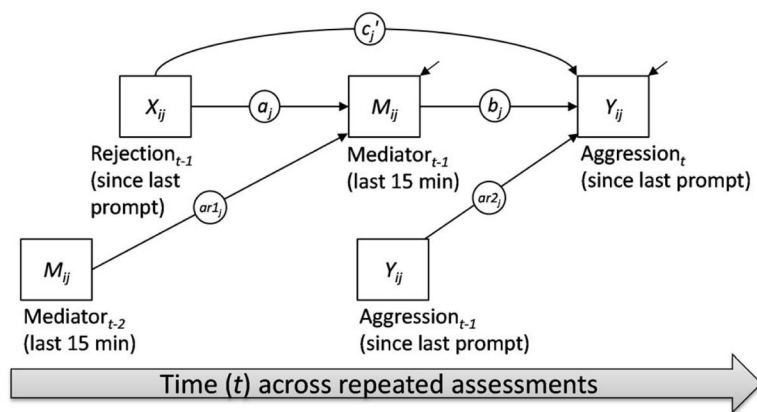


Figure 2. Path diagram depicting randomly varying within-person slopes (paths a , b , c' , $ar1$, and $ar2$ for individual j) estimated in the initial models. All within-person variables were person-mean centered, and between-person variables (not pictured) were grand-mean centered. Covariates (not pictured) on Aggression in all models included time (elapsed in protocol) at time t , victimization at time t , observed person mean levels of X and M , age, compliance (number of entries completed), and borderline and antisocial personality disorder severity (SIDP-IV dimensional scores).

Table 1 Borderline personality disorder (BPD) and antisocial personality disorder (ASPD) symptoms in study sample (N = 117)

BPD criterion	N	%	ASPD criterion	N	%
1. Efforts to avoid abandonment	17	14.5	1. Unlawful behaviors	30	25.6
2. Unstable relationships	41	35.0	2. Deceitfulness	13	11.1
3. Identity disturbance	8	6.8	3. Impulsivity/failure to plan ahead	16	13.7
4. Impulsivity (self-damaging)	47	40.2	4. Irritability/aggressiveness	41	35.0
5. Suicide/self-harm behavior	38	32.5	5. Reckless disregard for safety	11	9.4
6. Affective instability	33	28.2	6. Irresponsibility	33	28.2
7. Chronic emptiness	20	17.1	7. Lack of remorse	7	6.0
8. Intense anger	77	65.8	C. Evidence of conduct disorder	17	14.5
9. Paranoid/dissociative	8	6.8			

BPD symptom counts (# criteria)	N	%	ASPD symptom counts (# criteria, excluding C)	N	%
0	21	17.9	0	46	39.3
1	20	17.1	1	30	25.6
2	24	20.5	2	20	17.1
3	21	17.9	3	8	6.8
4	15	12.8	4	9	7.7
5+	16	13.7	5+	4	3.4

Note. Criteria were counted as present (i.e., above threshold) based on item scores 2 on the Structured Clinical Interview for DSM-IV Personality Disorders (SIDP-IV; Pfohl, Blum, & Zimmerman, 1997). Consistent with diagnostic criteria for ASPD, Criterion C (evidence of conduct disorder before age 15) is not included in symptom counts but is required for diagnosis. Other personality disorders were also present in the sample above diagnostic thresholds, with the most frequently occurring diagnoses (after BPD) being antisocial (8%) and avoidant (6%) personality disorders. Nine (56%) of those with a BPD diagnosis also met criteria for another personality disorder, including antisocial ($n = 2$), schizoid ($n = 1$), paranoid ($n = 1$), narcissistic ($n = 1$), avoidant ($n = 1$), histrionic ($n = 1$), and both paranoid and avoidant ($n = 1$).

Table 2

Multilevel summary statistics for all study variables at each level of analysis

	Individuals (Level 2)				Observations (Level 1)				ICC		
	N	Min	Max	M	SD	N	Min	Max		M	SD
Age	117	18.0	24.0	20.58	1.46						
Compliance (# completed entries)	117	24.0	150.0	112.28	31.99						
ASPD severity	117	0.00	17.00	4.14	3.99						
BPD severity	117	0.00	23.00	6.85	4.63						
Time (in units of days)	117	2.55	13.10	9.47	1.76	12759	0.00	22.48	9.83	6.06	.05
Perceived Rejection	117	1.00	2.04	1.12	0.18	11035	1.00	5.00	1.11	0.47	.13
Perceived Criticism	117	1.00	1.47	1.08	0.10	11038	1.00	5.00	1.07	0.38	.06
General Negative Affect	117	1.00	2.59	1.25	0.27	12757	1.00	5.00	1.24	0.44	.38
Anger	117	1.00	3.64	1.37	0.37	12757	1.00	5.00	1.36	0.68	.29
Shame	117	1.00	1.99	1.14	0.21	12757	1.00	5.00	1.13	0.38	.28
Aggression (binary)	117	0.00	0.15	0.02	0.03	10987	0.00	1.00	0.02	0.14	.03
Victimization (binary)	117	0.00	0.06	0.006	0.01	10957	0.00	1.00	0.005	0.07	-

Note. ASPD = Antisocial Personality Disorder; BPD = Borderline Personality Disorder. Severity scores were calculated based on sums of corresponding items from the Structured Clinical Interview for DSM-IV Personality Disorders (SIDP-IV; Pfohl, Blum, & Zimmerman, 1997). Intraclass correlation coefficients (ICCs) represent the proportion of variability in repeated measures from the ecological momentary assessment protocol that is between individuals. Within-individual variability can be computed by subtracting the ICC from one (thus, 62–97% of the variability in these measures was within individuals). The ICC for victimization could not be computed due to low frequency.

Table 3

Summary of final within-persons mediation results at mean levels of BPD and ASPD severity scores

Model	Independent Variable (IV)	Mediating Variable (MV)	Dependent Variable (DV)	Effect of IV on MV (a)	Effect of MV on DV (b)	Direct effect of IV on DV (c')	Indirect Effect (a * b)	95% CI for Indirect Effect	Total Effect (c)
1	Rejection at time <i>t-1</i>	GNA at time <i>t-1</i>	Aggression at time <i>t</i>	0.21 (0.02)***	0.42 (0.20)*	0.24 (0.15)	0.09 (0.04)*	0.01 - 0.17	0.33 (0.14)*
2	Rejection at time <i>t-1</i>	Anger at time <i>t-1</i>	Aggression at time <i>t</i>	0.32 (0.03)***	0.42 (0.13)***	0.26 (0.13)*	0.14 (0.04)**	0.05 - 0.22	0.39 (0.14)**
3	Rejection at time <i>t-1</i>	Shame at time <i>t-1</i>	Aggression at time <i>t</i>	0.13 (0.01)***	-0.47 (0.27)	0.23 (0.13)	-0.06 (0.04)	-0.13 - 0.01	0.16 (0.13)

Note. ASPD = Antisocial Personality Disorder; BPD = Borderline Personality Disorder. GNA = General Negative Affect. Unstandardized coefficients are reported with standard errors in parentheses. Mediating variables were assessed at time *t-1* while controlling for the same measure at *t-2*, and aggression was assessed at *t* while controlling for aggression at *t-1*. Because aggression is binary, model coefficients for aggression can be interpreted as the change in log odds (i.e., logit) of aggressive urges or behaviors per a one-unit change in the predictor. All within-person variables (IV, MV, and DV) were person-mean-centered. All models were adjusted for time (elapsed in protocol) at time *t*, victimization at time *t*, observed person mean levels of negative affects (e.g., GNA, Anger, Shame), age, compliance (number of entries completed), and BPD and ASPD severity scores (SIDP-IV dimensional scores). Models with Anger or Shame as the mediator were adjusted for GNA at *t-1* at level 1 and person mean levels of GNA at level 2 (with overlapping items removed from the general NA scale).

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Indirect and total effects of perceived rejection on likelihood of aggression at varying levels of BPD and ASPD severity scores

Table 4

BPD severity level	Model 1: Effect via GNA as mediator		Model 2: Effect via Anger as mediator		Model 3: Effect via Shame as mediator	
	Indirect	Total	Indirect	Total	Indirect	Total
- 1.5 SD	0.05 (0.03)	0.29 (0.14)*	0.09 (0.04)*	0.35 (0.14)*	-0.03 (0.02)	0.20 (0.13)
- 1 SD	0.06 (0.03)	0.30 (0.14)*	0.10 (0.04)*	0.36 (0.14)**	-0.04 (0.02)	0.19 (0.13)
+ 1 SD	0.11 (0.05)*	0.35 (0.14)*	0.17 (0.05)**	0.43 (0.14)**	-0.09 (0.05)	0.14 (0.13)
+ 2 SD	0.14 (0.06)*	0.38 (0.14)**	0.20 (0.06)**	0.46 (0.14)**	-0.11 (0.06)	0.11 (0.13)
+3 SD	0.17 (0.08)*	0.40 (0.14)**	0.24 (0.07)**	0.49 (0.15)**	-0.14 (0.08)	0.09 (0.13)
ASPD severity level						
- 1 SD	0.11 (0.05)*	0.35 (0.14)*	0.16 (0.05)**	0.42 (0.14)**	-0.08 (0.04)	0.15 (0.13)
+ 1 SD	0.07 (0.03)*	0.30 (0.14)*	0.11 (0.04)**	0.37 (0.14)**	-0.05 (0.03)	0.17 (0.13)
+ 2 SD	0.05 (0.03)	0.28 (0.15)	0.09 (0.04)*	0.34 (0.14)*	-0.04 (0.03)	0.19 (0.13)
+3 SD	0.03 (0.03)	0.26 (0.15)	0.06 (0.04)	0.32 (0.14)*	-0.03 (0.03)	0.20 (0.13)

Note. ASPD = Antisocial Personality Disorder; BPD = Borderline Personality Disorder. GNA = General Negative Affect. Unstandardized coefficients are reported with standard errors in parentheses. Each level of BPD and ASPD symptoms reported were represented in the sample, with the lowest level (-1.5SD for BPD; -1SD for ASPD) being equal to a dimensional severity score of zero (no symptoms). Because the moderators were grand-mean-centered, effects at varying levels of BPD are at the mean level of ASPD symptoms, and vice-versa.

* $p < .05$.

** $p < .01$.

*** $p < .001$.