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# Impact of Negative Affect and Borderline Personality Disorder Symptomatology on Agressive Behavior

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The current study examined whether individuals with borderline personality disorder (BPD) symptomatology would vary in their aggressive behavior following mood induction. One hundred and eighty-four males and females were randomly assigned to a neutral, sad, or anger mood induction. Following mood induction, individuals participated in an aggression paradigm disguised as a competitive reaction-time task wherein they were free to administer or refrain from administering shocks to an ostensible opponent. Results indicated that there were no main effects of gender, BPD symptomatology, or condition on aggressive behavior. Explication of a three-way interaction among BPD, gender, and condition revealed that when experiencing negative affect (anger or sadness), females endorsing higher levels of BPD symptomatology were less physically aggressive than their low BPD symptomatology counterparts. Results are discussed in relation to emotion regulation.

*Keywords*: Borderline Personality Disorder, Emotion Regulation, Aggression

Given the abundance of information presented in the media regarding violence and crime, it is not surprising that aggression presents a substantial problem in society. Due to the multifaceted nature of aggression, no single risk factor can predict its occurrence. A combination of internal factors (i.e., personality and biological differences) along with environmental determinants, including what is observed and learned in home environments and promoted within a culture, work in unison to either inhibit or facilitate aggression (Anderson & Bushman, 2002). Within the past decade, researchers have begun to explore whether individual differences in emotion regulation predict maladaptive behaviors, including aggression. Gross and Muñoz (1995) proposed that emotion regulation and attendant difficulties are responsible for a diverse range of psychopathology. Emotion dysregulation has been implicated in a variety of clinical disorders, most notably with regard to borderline personality disorder (BPD) according to the work of Marsha Linehan (1993).

Affective instability and impulsive aggression have been posited as core features of BPD (Critchfield, Levy, & Clarkin, 2004; Fossati et al., 2005; Skodol et al., 2002). Therefore, borderline personality disorder is highly relevant to the study of emotion regulation and aggression. Aggression, undoubtedly a destructive behavior, is believed to function as an inappropriate coping strategy used to diminish emotional arousal (Putnam & Silk, 2005). Given the potentially deleterious effect of emotion dysregulation, a frequent occurrence within individuals with BPD, it is evident that identifying triggers and consequences of emotional dysregulation is a high social priority. In a laboratory study, institutionalized women with borderline personality disorder demonstrated a threefold increase in aggressive responses (subtracting money from an ostensible opponent) than controls (Dougherty, Bjork, Huckabee, Moeller, & Swann, 1999). However, this difference became non-significant when accounting for depressive symptomatology. These authors contended that negative affectivity, specifically depression, manifested itself through aggressive responding in these individuals, especially in response to a provocative situation (points exchangeable for money were being subtracted from participants by their "opponent" as well), a finding consistent with past research (Bjork, Dougherty, & Moeller, 1997).

From these findings, it is clear that the experience of negative affect is not homogeneous. Negative affect encompasses multiple emotions, including sadness, anger, shame, and anxiety. Consequently, it is likely that different types of negative affect have different effects on behavior. Several studies have examined the experience of negative affect (type, lability), but comparisons between different discrete negative emotions and their impact on aggressive behavior have yet to be investigated. Dougherty and colleagues (1999) identified depression as a predictor of aggression in individuals diagnosed with BPD. However, anger, rather than anxiety or depression, is a robust predictor of BPD (Henry et al., 2001; Koenigsberg et al., 2002; Trull et al., 2008). Therefore, in the present study, the relationship between negative affect and aggression in individuals with features of borderline personality disorder was examined. Given literature indicating that individuals with borderline personality disorder are more prone to experience negative affect (e.g., Widiger, 2005) and the finding that trait negative emotionality is correlated with greater aggressive responses (Verona, Patrick, & Lang, 2002), the goal of the present study was to understand how different experiences of negative affect, specifically sadness and anger, relate to aggression in individuals with BPD symptomatology.

With regard to main effects, it was hypothesized that negative mood induction (anger or sadness in comparison to a neutral mood induction), higher levels of borderline personality features, and gender would predict higher levels of aggression across three indices—general aggression, intense aggression, and initial aggression. A main effect of gender was hypothesized, given past research findings that males demonstrate greater levels of physical aggression (Zeichner, Parrott, & Frey, 2003). A three-way interaction of gender, level of borderline personality disorder features (measured as a continuous variable), and affect

(mood induction conditions measured as a categorical variable) on all three indices of aggression was hypothesized such that male gender, higher BPD features, and negative affect (anger and sadness) would result in the highest levels of aggression across all three indices.

## Method

### Participants

Following approval from the Institutional Review Board, 205 male and female students were recruited from the research participant pool of a university in the southeastern United States to take part in an experimental study in return for partial course credit. Students were provided alternative options for course credit if they declined research participation. Participants were informed that the purpose of the study was to assess the impact of personality and environmental factors, including mood, on reaction time.

### Measures

**Personality Assessment Inventory Borderline Features Scale.** The Personality Assessment Inventory Borderline Features Scale (PAI-BOR; Morey, 1991) measures symptomatology characteristic of individuals with BPD and associated personality disorders. It comprises 24 items rated on a 4-point scale (*false, slightly true, mainly true,* and *very true)*, with higher scores reflective of a higher number of BPD features. Previous analyses (Trull, 1995; Trull, Useda, Conforti, & Doan, 1997) have indicated that scores higher than or equal to 38 (raw score) are predictive of difficulties across multiple domains (e.g., academics, work, relationships); however, the PAI-BOR is not intended for diagnosis. Consistent with a dimensional view of personality and personality disorders (Widiger, Livesley, & Clark, 2009; Widiger & Mullins-Sweatt, 2010), scores were not dichotomized for analyses.

Exploratory factor analysis of a non-clinical sample revealed that a 6-factor model of the PAI-BOR provided the best fit (Jackson & Trull, 2001), rather than the initial 4-factor model from a predominantly male clinical sample (Morey, 1991). These six factors correspond with criteria from the DSM-IV-TR (American Psychological Association, 2000) and include impulsivity/dyscontrol, mood instability, chronic emptiness, separation concerns, negative relations, and reckless spending. The PAI-BOR has demonstrated good convergent validity, correlating positively with negative affect, depression, coping resources, distress, and general psychopathology (Trull, 1995). Coefficient alpha for the PAI-BOR Total score was .86.

**Modified Positive and Negative Affect Schedule.** The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) is designed to assess current levels of positive and negative affect. A modified version of the positive affect (happiness), negative affect (sadness), and anger scales was utilized in the current study to provide a brief assessment of participants' mood states to verify efficacy of mood induction procedures. Participants rate the degree to which they experience a particular mood descriptor on a 5-point scale, ranging from "1" (very slightly or not at all) to "5" (intensely). Cronbach's alpha coefficients for the happiness, sadness, and anger subscales were .90, .80, and .74.

**Response Choice Aggression Paradigm.** The Response Choice Aggression Paradigm (RCAP; Zeichner, Frey, Parrott, & Butryn, 1999) is a modification of Taylor's aggression paradigm (Taylor, 1967), which is designed to assess direct, physical aggression via electrical shock in a laboratory setting as an analogue to naturally-occurring aggression. Participants are informed that the procedure is a competitive reaction-time task in which they are ostensibly competing against another individual to whom they can choose to deliver shocks and from whom they may receive shocks. Unlike similar aggression paradigms, this procedure allows the participant to shock or refrain from shocking during each trial, providing a truly non-aggressive option, ultimately constituting a more realistic interpretation of individual differences in aggressive responding (Netter, Henning, Rorhmann, Wyhidal, & Hain-Hermann, 1998).

The RCAP provides three overall indices of aggression: initial, general, and intense aggression. Initial aggression is measured via *Flashpoint Duration* (FPD; duration of the first shock administered) and *Flashpoint Intensity* (FPI; the level of the first shock administered). Composite scores for initial aggression are calculated by computing an average of standardized FPI and FPD. Similarly, general aggression is measured by creating a composite score of *Mean Shock Intensity* (MSI; mean shock intensity for trials in which the participant administers a shock), *Mean Shock Duration* (MSD; mean shock-time duration for trials in which the participant administers shocks), and *Shock Frequency* (SF; the number of trials overall in which the participant administers a shock). Intense aggression is represented by *Proportion of Highest Shock* (P10; the number of times the participant chooses the highest shock level available during trials in which he or she administers a shock).

**Mood Induction.** Three mood states were induced in participants via brief (e.g., less than three minute) film clips. These comprised sadness, anger, and a neutral mood state induction. The use of film for the mood induction procedure was chosen based on results from a meta-analysis of mood induction procedures (Westermann, Spies, Stahl, & Hesse, 1996). Gross and Levenson (1995) suggest that film clips are advantageous for mood induction purposes, especially in Western society, in which films are often used as a mechanism through which to experience emotion. Additionally, film clips can be standardized and administered easily and have been validated as an effective means of manipulating mood (Hewig, Hagemann, Seifert, Naumann, & Bartussek, 2005).

Participants in the neutral mood induction viewed a clip of *Hannah and her Sisters* (Orion Pictures, 1986) in which two women are shopping and discussing an upcoming audition. This film clip was chosen based on its lack of significant positive or negative mood changes upon viewing (Hewig et al., 2005). For the negative mood inductions, films were chosen based on their demonstrated capacity to induce negative affect (i.e., sadness or anger) at a significantly greater rate than any other emotion (Gross & Levenson, 1995; Hewig et al., 2005). Participants assigned to the sadness mood induction were shown a clip from the film *The Champ* (Metro-Goldwyn-Mayer, 1979) wherein a young child witnesses a boxer die; those assigned to the anger mood induction were shown a clip from *Witness* (Paramount Pictures, 1985) wherein a group of individuals are mocked for their religious affiliation.

**Opponent Evaluation Scale**. The Opponent Evaluation Scale (OES) is a brief scale designed for the current study that measures the participant's perception of the accuracy and validity of the reaction time task, fairness ratings of the fictitious opponent, and questions regarding the dynamic of the relationship. Participants rate their responses on a 5-point scale, ranging from "1" (strongly disagree) to "5" (strongly agree). Participants disagreeing with the validity of the reaction time task, as indicated by a response of either "1" or "2," are further probed by the experimenter upon collection of OES data to determine effectiveness of the deception.

**Procedure**

During the informed consent process, participants were informed that the experiment involved electrical shocks, were reminded that their participation was voluntary, and were informed that they could cease participation at any time without any penalty. Upon obtaining informed consent to participate, participants completed a packet of questionnaires, including demographic information, PANAS, and the PAI-BOR. Once questionnaires were completed, participants were randomly assigned to view one of the three film clips. Participants entered a sound-attenuated chamber and sat at a table facing a television screen. They were informed that the task involved understanding how personality and environmental factors (e.g., mood) impacted reaction time. Participants were provided with detailed instructions regarding the reaction time task and completed pain tolerance assessments prior to the mood induction. This procedure was undertaken to prevent the instructional process from interfering with the mood induction procedure and the RCAP. For the pain tolerance assessment, participants first heard an audio recording of the "opponent's" pain tolerance assessment (e.g., a recording of an individual reporting on shocks beginning with "0" and increasing until "10"), with female recordings played for female participants and male recordings played for male participants to avoid potential cross-gender interactions. This procedure was followed to increase the plausibility of the experiment to the participant. Next, each participant's pain tolerance was determined via the administration of short duration shocks (.50-sec), generated by a Precision Regulated Animal Shocker (Coulbourn Instruments, Allentown, PA) in an incremental stepwise intensity method (8 micro amps per step) from the lowest available shock setting, which was imperceptible, until the shocks reached a reportedly "painful" level. This procedure was used to determine the range of shocks that were to be administered to each participant so that no shock exceeded their individual pain tolerance.

Following the pain tolerance assessment, participants underwent mood induction procedures as outlined above. After viewing the film, participants completed a second modified PANAS followed by the RCAP task. In this task, participants were seated facing an "aggression console," comprised of electrical switches and light emitting diodes (LEDs). Participants were instructed to follow a light sequence, consisting of a red "get ready" light to prepare for the upcoming trial, a yellow "press" light, indicating to the participant to press a reaction time key, and a green "release" light indicating to the participants to remove their finger from the reaction time key as quickly as possible. Identical feedback regarding ostensible "wins" and "losses" was generated for each participant via a computer program designed to have each participant win and lose an equal number of trials, and an illuminated LED on the console indicated the outcome ("win" or "lose"). Participants were then given a 6-second interval in which they could choose to shock or refrain from shocking their opponent. Ten shock intensities ranging from "1" to "10" were available and represented shocks consistent with 55% to 100% of the participants' reported pain tolerance established during the pain tolerance assessment. Participants were informed that their opponent had the same shocks at his or her disposal. Shocks were administered via a computer program and all participants received the same win-loss sequence and range of shocks from their ostensible opponent. The RCAP comprised 30 successive trials, on 12 of which participants received shocks set between 55% and 100% of their pain tolerance. Participants began receiving shocks on the sixth trial. To ensure success of the deception of the reaction time task against an ostensible opponent, the shocks increased in intensity in a predetermined fashion up to shock level "10."

Upon completion of the reaction time task, participants were administered the PANAS and the OES. Following all experimental tasks, participants were then shown a film segment from *When Harry Met Sally* (Columbia Pictures, 1989) to prevent any potential distress associated with the negative mood induction. This film clip has been empirically shown to induce positive mood (Hewig et al., 2005). Finally, participants were debriefed wherein they were informed that they were not actually administering shocks to another person, thanked, and given research participation credit.

## Results

**Participants**

Participants who expressed doubt regarding the veracity of the reaction time task as well as those for whom shock levels were not recorded due to technical error were excluded from analyses ($n$ = 21). Of the initial 205 participants recruited for the study, 184 (86 males, 98 females) were included in the analyses. The mean age of participants was 19.0 years, $SD$ = 1.17; 76.1% identified as Caucasian, 8.2% African American, 10.3% Asian American, 2.7% & Hispanic or Latino, 2.7% Other. Mean scores on the PAI-BOR were comparable for males ($M$ = 29.9, $SD$ = 10.94) and females ($M$ = 31.4, $SD$ = 9.68), $t$ (176) = -.95, $ns$, $d$ = -.14 and are consistent with scores obtained in previous studies utilizing college samples (Trull, 1995).

**Mood Induction**

To determine whether differences existed in reports of affect between conditions, one-way ANOVAs were conducted using condition as the independent variable and change in affect scores from pre- to post-mood induction on the three moods as the dependent variable. For changes in sadness, analysis revealed significant differences between condition, $F$ (2,181) = 29.33, $p$ < .001. Pair-wise contrasts were then computed to determine how the conditions differed. Participants in the sadness mood induction were significantly sadder than those in the neutral mood induction (Mdifference = -2.96, $p$ < .001) as well as those in the anger mood induction ($Mdifference$ = -2.78, $p$ < .001). Pair-wise contrasts indicated no significant differences on sadness between the neutral

and anger mood inductions, (*Mdifference* = -.18, $p > .05$). For change in anger from pre- to post- mood induction, a one-way ANOVA revealed significant differences between condition, $F$ (2,181) = 19.87, $p < .001$. Pair-wise contrasts indicated that participants in the anger mood induction reported significantly higher levels of anger than the sadness or neutral mood induction (*Mdifference* = -2.50, $p < .001$) and (*Mdifference* = -2.25, $p < .001$), respectively. No differences were found on reports of anger post-induction between the sadness and neutral conditions (*Mdifference* = .248, ns). Finally, a one-way ANOVA revealed significant differences among conditions for changes in happiness, $F$ (2,181) = 11.83, $p < .001$. Results of pair-wise contrasts indicated that participants in the sadness mood induction were significantly less happy than either the neutral or anger mood induction, (*Mdifference* = 2.74, $p < .001$ and *Mdifference* = 1.57, $p < .001$), respectively. Participants in the anger mood induction were also significantly less happy than those in the neutral mood induction, (*Mdifference* = -1.17, $p < .001$).

After determining that the mood induction groups significantly differed from each other, paired samples t tests were computed for each condition to determine the differences from pre- to post-mood induction. In the sadness condition, paired-samples t tests revealed that sadness significantly increased, $t$ (59) = -10.00, $p < .001$, $d$ = 2.60, happiness significantly decreased, $t$ (59) = 9.23, $p < .001$, $d$ = 2.40, while no significant changes in anger were observed, $t$ (59) = .368, *ns*, $d$ = .09. In the anger condition, $t$ tests revealed significant increases in both sadness and anger, $t$ (62) = -2.81, $p < .01$, $d$ = -.71 and $t$ (62) = 6.53, $p < .001$, $d$ = 1.66, respectively. Participants in the anger condition also reported significantly less happiness $t$ (62) = 5.88, $p < .001$, $d$ = 1.49. Finally, in the neutral film condition, significant decreases were observed in ratings on happiness $t$ (60) = 2.99, $d$ = .78, while changes in both sadness and anger were non-significant, $t$ (60) = -1.51, *ns*, $d$ = -.39, and $t$ (60) = -.53, *ns*, $d$ = -.12.

**Bivariate Correlations**

Pearson product-moment coefficients were computed to analyze the relationships between the independent and dependent variables (see Table 1). All indices of aggression were correlated with one another. However, correlations between general, initial, and intense aggression, gender, and borderline personality disorder symptomatology were non-significant.

**Regression Analyses**

To reduce multicollinearity, mean scores were computed and subtracted from the total scores to create centered variables for all continuous predictors. Hierarchical multiple regression analyses were performed to determine whether borderline personality disorder symptomatology independently, or in combination with gender and/or mood condition, interacted to predict general, initial, or intense aggression. Dummy variable codes were created to represent the three mood induction conditions. In the first step, the aggression composite score was regressed on BPD symptom total, gender, and the condition dummy codes. Next, interaction terms for BPD symptom total by gender, BPD symptom total by condition, and gender by condition were entered. Finally, a three-way interaction term was created to determine the combined effects BPD symptom total by gender by condition. Variance accounted for, represented as R2, was examined at each step to determine whether the model significantly predicted aggressive behavior. Consistent with Aiken and West (1991), significant interaction terms were then subjected to simple slopes analyses by gender and condition to examine the nature of the interaction and determine whether the simple slopes significantly differed from zero. Due to standardization of the variables, unstandardized betas are reported.

**Effects of Condition, Gender, and BPD Symptomatology on General Aggression.** Contrary to hypotheses, neither gender nor condition resulted in main effects in the prediction of aggressive behavior. For general aggression, there was a significant BPD by gender by condition interaction, which accounted for 6% of the variance (see Table 2). For males in the sadness condition, BPD symptomatology was not significantly related to general aggression ($b$ = .02, *ns*), whereas for females in the sadness condition, BPD symptomatology was significantly negatively related to aggression ($b$ = -.05, $p < .05$). There was also a significant three-way interaction of BPD symptomatology by gender in the neutral condition, although examination of the simple slopes revealed that neither slope significantly differed from zero; for males ($b$ = -.02, *ns*) and for females ($b$ = .00, ns). Therefore, despite a significant interaction term, the lack of significant slope differences, which may have resulted from decreased power within secondary analyses, prohibits further examination. Last, in the anger condition, BPD symptomatology was not significantly related to general aggression in either males ($b$ = .00, ns) or females ($b$ = .01, ns).

Table 1. *Pearson product-moment correlations between gender, personality traits, and aggression*

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1. Gender | -- | -.11 | -.13 | -.06 | .07 |
| 2. General Aggression | | -- | .65** | .47** | -.03 |
| 3. Initial Aggression | | | -- | .57** | -.05 |
| 4. Intense Aggression | | | | -- | .02 |
| 5. PAI Total | | | | | .86 |

** = $p < .01$, Italicized numbers on the diagonal represent reliability coefficients.

Table 2. *Regression Analyses: BPD and Gender with Neutral as Reference Group*

| GENERAL AGGRESSION | | b | SE | β | R2/ Δ R2 |
|---|---|---|---|---|---|
| Step 1 | Gender | -.22 | .15 | -.11 | |
| | Code 1 | -.02 | .18 | -.01 | |
| | Code 2 | -.23 | .18 | -.11 | |
| | BPD | .00 | .01 | -.02 | .02 |
| Step 2 | Gender x Code 1 | .10 | .37 | .04 | |
| | Gender x Code 2 | .19 | .37 | .07 | |
| | BPD x Code 1 | .01 | .02 | .06 | |
| | BPD x Code 2 | .00 | .02 | -.03 | |
| | BPD x Gender | -.01 | .02 | -.09 | .03/.01 |
| Step 3 | BPD x Gender x Code 1 | -.02 | .04 | -.09 | |
| | BPD x Gender x Code 2 | -.09** | .04 | -.30 | .06/.03 |
| | | | | | |
| INITIAL AGGRESSION | | b | SE | β | R2/ Δ R2 |
| Step 1 | Gender | -.20 | .15 | -.10 | |
| | Code 1 | -.04 | .18 | -.04 | |
| | Code 2 | -.12 | .18 | -.02 | |
| | BPD | .00 | .01 | -.06 | .02 |
| Step 2 | Gender x Code 1 | .03 | .37 | .01 | |
| | Gender x Code 2 | .27 | .37 | .10 | |
| | BPD x Code 1 | -.01 | .02 | -.10 | |
| | BPD x Code 2 | -.01 | .02 | -.03 | |
| | BPD x Gender | -.01 | .02 | -.08 | .03/.01 |
| Step 3 | BPD x Gender x Code 1 | -.04 | .04 | -.18 | |
| | BPD x Gender x Code 2 | -.06 | .04 | -.21 | .04/.01 |
| | | | | | |
| INTENSE AGGRESSION | | b | SE | β | R2/ Δ R2 |
| Step 1 | Gender | .10 | .15 | -.05 | |
| | Code 1 | .27 | .18 | .13 | |
| | Code 2 | .27 | .18 | .13 | |
| | BPD | .00 | .01 | .01 | .02 |
| Step 2 | Gender x Code 1 | -.11 | .37 | -.04 | |

| | | | | | |
|---|---|---|---|---|---|
| | Gender x Code 2 | .35 | .37 | .13 | |
| | BPD x Code 1 | -.03 | .02 | -.20 | |
| | BPD x Code 2 | -.01 | .02 | -.06 | |
| | BPD x Gender | -.02 | .02 | -.13 | .05/.03 |
| Step 3 | BPD x Gender x Code 1 | -.08** | .04 | -.38 | |
| | BPD x Gender x Code 2 | -.08** | .04 | -.27 | .08/.03 |

Note: Code 1 = Neutral vs. Anger, Code 2 = Neutral vs. Sadness; $^{**}p < .05$.

**Effects of Condition, Gender, and BPD Symptomatology on Initial Aggression.** None of the predictors accounted for significant variance in initial aggression scores (see Table 2).

**Effects of Condition, Gender, and BPD Symptomatology on Intense Aggression.** For intense aggression, there was a significant BPD by gender by condition interaction, which accounted for 8% of the variance (see Table 2). However, examination of the simple slopes revealed that BPD symptomatology was not significantly related to intense aggression in the sadness condition for males ($b$ = .02, ns) or females *(*$b$ = -.02, *ns*). There was also a significant three-way interaction of BPD symptomatology by gender in the neutral condition, and although the trends were in opposite directions, examination of the simple slopes revealed that neither slope significantly differed from zero; for males ($b$ = -.01, *ns*) and for females ($b$ = .03, *ns*). In the anger condition, BPD symptomatology was significantly negatively related to intense aggression for females ($b$ = -.03, $p < .05$), but was not significantly related to aggression for males ($b$ = .01, ns).

## Discussion

The present study sought to examine effects of gender, borderline personality disorder symptomatology, and negative affect on aggressive behavior. Based on extant research (e.g., Zeichner et al., 2003), we hypothesized a main effect of gender, such that men would be more aggressive than women. Also, given previous theoretical and empirical associations of negative affect with attendant aggressive behavior (Berkowitz, 1990; Buss, 2004; Parrott & Zeichner, 2003), we hypothesized that negative affect would result in higher aggression. Finally, we hypothesized that both gender and state negative affect would interact with personality traits in predicting aggressive behavior such that men with higher levels of BPD in the negative affect mood conditions would evidence the greatest amount of aggression. Hypotheses for main effects of gender, negative affect, and BPD symptomatology on aggression were not supported, and analyses must be interpreted in the context of complex interactions.

Despite significant three-way interactions among BPD symptomatology, gender, and condition, examination of the simple slopes frequently revealed that personality variables were not significantly different from zero in predicting physical aggression. Analyses indicated that BPD symptomatology in women significantly predicted decreases in general physical aggression following both the sadness and anger mood inductions. This finding contrasts established theory supporting the role of negative affect in promoting aggressive behavior (Berkowitz 1989; 1990). Furthermore, while acknowledging that state measures of sadness and depression are related, yet separate measures, this finding is surprising based on previous studies establishing a relationship between depression and aggression (Bjork et al., 1997; Dougherty et al., 1999).

While it is possible that anger in women with BPD symptomatology is associated with decreases in aggression, it is likely that this is a result of the particular mood induction procedure chosen for this study. The film clip chosen to induce anger has and continues to demonstrate effectiveness in eliciting anger. However, the results of this and previous studies suggest that changes in emotion, particularly negative affect, are difficult to induce discretely (i.e., without activating additional negative affect), though level of emotional intensities may differ (Hewig et al., 2005). Polivy (1981) notes that it is particularly challenging to induce mood states for discrete negative emotional states, including sadness, anxiety, and anger, a finding confirmed in a recent meta-analysis of mood induction procedures (Westermann et al., 1996). Alternative film induction procedures such as those employed by Papousek, Schulter, and Lang (2009) which utilize a highly controlled procedure (e.g., no sound, the same actress portraying different emotions in each clip) may be a useful tool for eliciting discrete affect, though may be less ecologically valid in context.

The difficulty in eliciting discrete negative affects is further complicated (or, perhaps, more properly accounted for) by differences in primary and secondary emotional responding (see Greenberg & Safran, 1987). Secondary emotional responding refers to the learned response, via processes of socialization and past experience, to a primary emotional response. Therefore, although the mood induction may initially result in increases in one emotion, such as anger, it is possible that experiential learning may predispose an individual to experience secondary emotional responses, such as sadness, shame, or guilt. Proclivity to experience stress and negative affect has, in fact, been shown to increase the salience of mood induction procedures and contributes to significant variability in intensity of mood induction states (Scherrer & Dobson, 2009). Additionally, individuals with

BPD often experience difficulties with emotion regulation, which suggests an inability to appropriately identify or differentiate among types of emotion (Wolff, Stiglmayr, Bretz, Lammers, & Auckenthaler, 2007). Therefore, without previous empirical support for decreases in physical aggression in women who are higher in BPD symptomatology following anger, it is difficult to disentangle the experience of anger from other plausible hypotheses. Additionally, the current study utilized a video clip portraying violence against members of a non-violent religion. Although this clip has been previously demonstrated to induce anger, it is possible that the participants of the current study also identified with the non-violent attitudes of the movie clip victims, thereby increasing anger but reducing likelihood to engage in aggressive responding. As such, aggression scores in the current sample may have been constrained.

The results of this study speak to the context specificity of personality variables that are likely to be activated in varying environmental contexts, including negative affect, in a differential manner. The present study suggests that, for women, the presence of symptoms of BPD decrease the chances of becoming physically aggressive when saddened. Given the robust associations between BPD, emotion dysregulation, and aggression, these findings are a critical juncture in differentiating likely pathways to physical aggression. In fact, the results of this study are in accordance with several lines of research utilizing mood induction in experimental paradigms. Both Chapman, Leung, and Lynch (2008) and Miller, Gaughan, Pryor, and Kamen (2009) reported that, despite hypothesizing otherwise, negative affect — particularly sadness —significantly reduces individuals with BPD from engagement in self-defeating behaviors such as impulsivity and social aggression (e.g., threatening, yelling, or using physical force in response to presentation of a hypothetical vignette). Miller et al. (2009) found that depressed affect resulted in decreases in abstract reasoning in individuals with symptoms of BPD, but actually predicted less aggressive self-reports of social functioning as well as longer delay of gratification. It is likely then, that negative affect in these individuals, coupled with poorer abstract reasoning, still predisposes them to engage in maladaptive behaviors. However, at least for women, physical aggression does not appear to be one of these behaviors. Future studies that examine additional types of negative affect, particularly anxiety and fear, may elucidate the relationship between BPD and aggressive behavior. Clearly, it would also be important to examine whether sadness is a trigger for other self-defeating behavior such as self-harm, substance abuse, and disordered eating.

The presence of the three-way interaction signifies that it is not simply BPD traits that account for differences in certain types of aggression. Rather, it is these personality traits acting in concert with environmental factors, including gender-specific processes of socialization that are resulting in observed differences in physical aggression. The surprising absence of a gender main effect, in that males and females were equally physically aggressive, may be accounted for by contextual determinants that interact with and, in essence, override dispositional or socialization factors. Indeed, meta-analytic findings demonstrate support for pertinent contextual factors taking precedence, as high levels of provocation appear to eliminate gender differences (Bettencourt et al., 2006). Perhaps the experience of negative affect was effective in equalizing dispositional traits and socialization processes across males and females.

The findings from this study are discrepant with those of Dougherty et al. (1999), in which a main effect of BPD was found, such that women with BPD subtracted significantly more points (which were related to monetary gain) from their opponent compared with a non-clinical community sample. However, when depressive symptoms were controlled for, the groups no longer differed in aggressive responding. As a result, Dougherty and colleagues (1999) posit that depressive symptomatology underlies aggressive responding in women with BPD. However, results from the present study suggest that this does not apply to physical aggression. It is possible that discrepant findings are a function of differing conceptualizations of aggression. In a comparison of the RCAP with the point subtraction aggression paradigm (PSAP) used by Dougherty and colleagues (1999), Giancola and Chermack (1998) argue that although the PSAP is an externally valid measure of aggression, its conceptualization of aggression, albeit direct, is different from the RCAP. Parrott and Giancola (2007) conceptualize aggression as measured via the PSAP as *theft aggression* rather than *physical aggression*. Specifically, as it is necessary to differentiate specific forms of negative affect in this relationship, it may also be necessary to investigate form of aggression separately.

Results of the present study should be interpreted with caution. The sample was primarily Caucasian, and, therefore, generalizability is limited in terms of race and ethnicity. Moreover, although BPD symptomatology has consistently been associated with negative outcomes in a collegiate sample, including poorer academic and occupational achievement and difficulties in interpersonal relationships (Bagge et al., 2004; Trull, 1995; Trull et al., 1997), the use of a clinical sample would greatly contribute to an understanding of the relationships among BPD, emotion regulation, and aggression. Despite this limitation, a preponderance of data suggests that personality, and therefore personality disorders, are best understood as dimensional constructs (Widiger et al., 2009; Widiger & Mullins-Sweatt, 2010). Therefore, it would follow that these findings may in actuality be an underestimation of difficulties for individuals meeting full BPD symptom criteria in that use of a clinical sample would serve to increase power. Lastly, while this study examined BPD symptoms as a unified construct, it is possible that particular facets of BPD specific to emotion regulation difficulties, impulsivity, or interpersonal difficulties may account for pathways to specific forms maladaptive behavior such as aggression and certainly warrant future research queries.

This study adds to the literature in that it provides a more thorough understanding of the relationship between BPD symptomatology and aggression. The inclusion of men in the sample is important, particularly given consistent findings that men score equally on self-report measures of BPD symptoms and report clinically significant levels of distress across multiple domains (De Moor, Distel, Trull, & Boomsma, 2009). A strength of this study is the use of an experimental paradigm to test for the effects of these constructs independently without sole reliance on self-report as a means to elucidating mechanisms of action for maladaptive behavior. Laboratory studies provide a uniform environment that

allows for a "cleaner" examination of individual differences that may play a role in aggressive responding. Indeed, utilization of experimental paradigms and in-the-moment assessments (see Trull et al., 2008) is necessary to produce ecologically valid results. These methods are crucial in developing a more comprehensive understanding of the experience and lability of emotion, and their utilization should be coupled with ecologically valid behavioral measurements (e.g., binging, purging, drinking, self-harm, aggression) to accurately assess the relationships among BPD and maladaptive behavior.

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