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BORDERLINE PERSONALITY DISORDER: HOW VARIOUS STRESSORS
IMPACT RUMINATION TENDENCIES

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ABSTRACT

The high prevalence of Borderline Personality Disorder (BPD) combined with a need to improve treatment efficacy produced a demand for the identification of how various risk factors are more likely to exacerbate BPD symptoms. While emotion dysregulation and interpersonal difficulties are known maladies of BPD, the goal of the present research was to examine their influence on rumination processes, thereby allowing therapeutic providers to facilitate treatment by honing in on specific stressors that are more likely to exacerbate symptoms due to initiating a ruminative response. A sample of 127 participants, 21 of whom endorsed clinical levels of BPD symptoms, were exposed to three conditions hypothesized to induce a ruminative response: listening to sad music, watching a sad film, and a social exclusion task where participants were gradually ostracized during a game of Cyberball. The first hypothesis was partially supported, as state rumination emerged as a significant predictor of post-music and post-film negative affect, while BPD traits emerged as the significant predictor of only post-Cyberball negative affect. The second hypothesis was partially supported, as significant differences in state rumination levels were not found when comparing the sad film and sad music conditions, however were found when comparing the Cyberball condition. The third hypothesis was supported, as emotion dysregulation was predictive of rumination tendencies across all tasks.

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CHAPTER I

INTRODUCTION

While many different opinions exist as to what constitutes ‘mental health’, the World Health Organization defines it as “a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community” (WHO, 2015). Using such a definition of health, Borderline personality disorder (BPD) can be argued to be the epitome of mental illness, as it is a chronic disorder characterized by emotional instability, impulsivity, and difficulty maintaining interpersonal relationships (Sharp et. al, 2011; Fonagy & Bateman, 2008). Borderline personality disorder is the most commonly diagnosed personality disorder in both inpatient and outpatient settings, with prevalence rates estimated to affect 1.5% of the general population (Lenzenweger, 2008) and 9% of the clinical population (Zimmerman, Rothschild, & Chelminski, 2005). Such prevalence creates an increased reliance on medical and psychological professions, as these individuals were found to be among the

most frequent users among mentally disordered individuals with regard to physician visits, emergency room visits, and hospitalizations (Hueston, Mainous, & Schilling, 1996). These visitations are often a consequence of impulsive and dysregulated behaviors, which unfortunately tend to be self-harming in nature and thus contribute to between 5 and 7% of these individuals completing suicide (Duberstein & Conwell, 1997). Such a behavioral profile is difficult to monitor in any individual, but the chronic and unrelenting nature of BPD poses a unique challenge to mental health professionals attempting to treat such a disorder (Selby & Joiner, 2009). Dysregulated behaviors are rarely limited to a singular domain, as they may often be interpersonal.

The social nature of humanity postulates that effective interpersonal interactions are a vital aspect of mental health. When such a critical life skill is hindered as it is in those with BPD, the results can be alarming. Examples of interpersonal problems seen in BPD populations include quarrelsome or aggressive behavior toward others (Russell, Moskowitz, Zuroff, Sookman, & Paris, 2007), excessive reassurance seeking (Selby, Anestis, & Joiner, 2008), and risky sexual behaviors (Selby & Joiner, 2013). Many of these behaviors have been found to have emotion regulating properties, as BPD individuals often report engaging in these behaviors as a method of reducing or avoiding the experience of negative emotion (Selby & Joiner, 2009). The interrelatedness among symptoms fosters difficulty in determining the temporal context of BPD etiology, as research has yet to clearly illuminate how underlying traits or processes may culminate as a BPD diagnosis (Selby & Joiner, 2009; Herr, Rosenthal, Geiger et al., 2013). However, several common denominators of BPD symptomatology have been recurrently studied, one of which being a difficulty developing and maintaining relationships.

1.1 *Interpersonal Relationships*

Human beings are social creatures who seek to connect with others in a way that they feel loved and appreciated. Granted, not all relationships are beneficial, as some can be more harmful than others. Those diagnosed with Borderline Personality disorder tend to find themselves experiencing more of the latter, which Linehan (1993) contends is due to maladaptive social factors such as growing up in invalidating environments where communication of emotional experience is met by erratic, inappropriate, and extreme responses by others. In theory, those with BPD may extrapolate such behavior to their own relationships by utilizing such responses in their relations with others. Such ill-advised mimicry of these socially learned responses will come across as uninviting and unreasonable to others, diminishing the likelihood of developing and maintaining close friendships or romantic relations. Such experiences would be taxing on anyone, but with the aforementioned emotion regulation difficulties seen in BPD individuals, they are increasingly prone to affective instability associated with daily behavioral and interpersonal problems (Russell et al., 2007). Furthermore, interpersonal confrontations are common triggers for impulsive self-harming behavior and suicide attempts seen in BPD (Brodsky, Groves, Oquendo, Mann, & Stanley, 2006). It appears poor emotion regulation dampens the likelihood of developing strong relationships, which feeds back into emotional anguish. Those with BPD incessantly search for positive interpersonal affairs to fill the void created by invalidating environments, yet they are ill-equipped to develop what they desire.

Researchers have theorized that abandonment fears, rejection sensitivity, and intolerance of aloneness may underlie many of the interpersonal difficulties common to

BPD (Gunderson & Lyons-Ruth, 2008). Therein lies the inconvenient paradox demonstrated in BPD; a deep desire for close contact with others is sabotaged due to an unpredictable and overwhelming distrust of others. A study by Stepp, Smith, Morse, Hallquist, and Pilkonis (2012) found that BPD characteristics uniquely predicted interpersonal sensitivity and aggression, a need for social approval, and a lack of sociability six months later. Such behavior can be taxing on those involved, thus at the first hint of emotional discomfort, BPD individuals spiral out of control and tear down the very relationships they hoped to create. Research done by Bender and Skodol (2007) describe this phenomena as BPD individuals displaying frantic efforts to avoid real or even imagined abandonment by alternating between extremes of idealization and devaluation.

Relationships are envisioned to be of a utopian quality and thus are quite difficult to sustain. Whereas most relationships have difficult moments that nonclinical populations will see as moments to learn from and work through, BPD individuals see irrevocable disasters that will leave them abandoned and disappointed. Interpersonal relationships could be said to serve a self-fulfilling prophecy of negativity, as BPD individuals' hypervigilance for discomfort fosters the uncomfortable feelings they aimed to avoid in the first place. These relationships appear to have been doomed from the start. A study by Miano, Fertuck, Arntz and Stanley (2013) supports this notion, as they argue that even subclinical level BPD individuals rate high in rejection sensitivity and untrustworthy trait appraisal. Thus, even those exhibiting subthreshold BPD traits are susceptible to the same self-fulfilling prophecy of hypervigilance and self-inflicted rejection (Miano, Fertuck, Arntz, & Stanley, 2013). This hypervigilance has also been

demonstrated by previous research which determined that BPD patients were significantly more likely to assign negative attributes and emotions to the picture of a face with a neutral expression (Donegan et al., 2003). It appears that BPD individuals are so biased toward negativity, that they will create it even when it is not present. The concept of neutrality appears to be foreign to those with BPD, as they appear to classify any individual into distinct positive and negative categories regardless of evidence to support such distinctions. To begin the process of mending such strict interpersonal schemas, Livesley (2005) suggests reframing cognitions and exploring BPD traits. A starting point may be to understand how a BPD individual thinks about and attempts to regulate their emotions, as the hallmark trait of emotion dysregulation seen in BPD unmistakably interferes with interpersonal interactions.

1.2 Emotion Regulation Deficits

In order to better understand how BPD individuals present with emotion regulation deficits, it may serve clinicians to understand how successful regulation can be presented. Thompson (1994) defined emotion regulation as “the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to accomplish one’s goals” (pp. 27–28). While all individuals will encounter situations that evoke different emotions of differing intensities, knowing how to effectively regulate the highs and lows of human experience is an important aspect of mental health. As Thompson alluded in his definition, failure to do so would surely interfere with achieving one’s goals. A mentally healthy individual would thus be able to use coping mechanisms to persevere through times of distress, in order to overcome the temporal nature of current situations. While current literature lacks

a consensus definition for emotion dysregulation, a recently proposed conceptualization by Gratz and Roemer (2004) offers that a lack of awareness for how to understand and access adaptive strategies for curbing emotional intensity leads to impulsive behavior when distressed. In essence, sustaining mental health hinges on the ability to successfully cope with life's demands. Such coping skills are vital to successfully regulating emotions, and a hindrance of such capabilities primes an individual for an aspect of mental illness.

Borderline Personality Disorder is no exception, as those diagnosed with BPD have been found to show a biological predisposition for intense affect and emotional vulnerability, leading individuals to be increasingly susceptible to stimuli grounded in negative content (Sauer & Joiner, 2012). Worsening the issue, BPD patients are found to use more emotion-oriented coping strategies than controls (Wingenfeld, Mensebach, Rullkoetter, Schlosser, Schaffrath, Beblo, & Driessen, 2009). This is important to note, because even though BPD individuals possess less effective emotion regulating approaches than nonclinical populations, they are more likely to rely on such ineffective strategies to cope with distress. A patient unaware of such a paradox will continue to live life at a disadvantage, possibly utilizing strategies that could likely compound or worsen their negative state.

Upon further examination of such ineffective regulation methods, a study conducted by Kuo and Linehan (2009) argues that BPD individuals may not be more reactive to their environment, but instead are biologically vulnerable to emotion dysregulation due to starting off with a higher baseline level of emotional intensity. From this viewpoint, individuals with BPD have a higher intensity of an emotional baseline,

requiring less of a stressor to be endured before a deregulated state is enacted. The emotional threshold seen in BPD populations suggests a limited emotional range, where the intensity of an emotional ceiling is rather close to a euthymic baseline, fostering a lifestyle where little stress is needed to reach a hypothetical emotional breaking point. Whereas a nonclinical population may be able to endure more stress before lashing out, as their emotional baselines are hypothesized to be farther from their emotional ceiling, BPD populations are currently believed to be constantly near a deregulated state. While research surely cannot account for all idiosyncratic triggers, key research studies have highlighted general patterns regarding what could likely trigger emotion dysregulation among BPD populations.

While previous studies (Sieswerda, Arntz, Mertens, & Vertommen, 2007; Wingenfeld et al., 2009) have found that BPD patients exhibit an emotionally intense attentional bias when confronted with personal schema-related stimuli, a goal of the present study is to expound on past research by examining whether such intense emotional responses will evoke a rumination response. Furthermore, this study will include interpersonal stimuli as well as non-interpersonal stimuli to determine whether the context of the stimuli makes a difference. Will negative interpersonal interactions impede emotion regulation processes more so than non-interpersonal cues via rumination tendencies? A recent study by Herr et al. (2013) found that difficulties with emotion regulation would fully mediate the relationship between BPD symptoms and interpersonal functioning. Such a finding could have implications, as it would follow that in the absence of emotion regulation difficulties, interpersonal problems would be greatly reduced.

The maladaptive emotion regulation strategy known as rumination may be an important target for interventions aiming to curb emotion dysregulation.

1.3 Rumination

Rumination was defined by Nolen- Hoeksema (1991) as the tendency to repetitively think about the causes, situational factors, and consequences of one's negative emotional experience. In other words, continuously focusing attention on emotionally relevant stimuli in a negative manner. While the study by Nolen-Hoeksema (1991) was in reference to depressive disorders, ruminative processes may serve as a common underlying cause of behavioral dysregulation in BPD, as recent studies show that rumination is prominent in persons with borderline personality disorder (BPD) and is correlated with symptom severity (Baer & Sauer, 2011). This makes sense, as BPD individuals are commonly experiencing negative interpersonal interactions and feeling distressed. While they may ruminate because they believe that doing so will increase their understanding of the situation and aid in problem solving (Papageorgiou & Wells, 2001), such efforts appear to be in vain. Rumination is counterproductive, as it prolongs and intensifies negative moods, which can lead to self-harm and aggressive behavior (Baer & Sauer, 2011). The specific mechanisms that cause emotion dysregulation to incite behavioral problems in BPD are still unclear, however as Selby and Joiner's (2009) Emotional Cascade Model of BPD posit that reducing rumination may serve as the primary mechanism of change in alleviating BPD symptomatology.

CHAPTER II

THE EMOTIONAL CASCADE MODEL

The construct of BPD can be viewed as an interrelated network of persistent symptoms, in which individuals with BPD undergo what is called an ‘emotional cascade,’ where each emotion, feeling, or behavior feeds into one another. Selby and Joiner (2009) posit that BPD individuals experience such a feedback loop when rumination tendencies on negative emotions increase original levels of negative affect, causing hypervigilance to emotional stimuli, thus resulting in more targets for rumination. This repetitive cycle of emotional negativity may account for the deregulated behaviors that are so central to BPD (Selby & Joiner, 2009). The emotional cascade process is helpful for understanding the wide array of emotional disturbances in BPD because it aims to explain how rumination can magnify negative affect and why minor negative emotional stimuli may be followed by an intense emotional and possibly behavioral response (Selby & Joiner, 2009).

A study by Sauer and Baer (2012) found evidence supporting the hypothesis that

instructing individuals to ruminate following anger induction lowers one's willingness to tolerate distress (Sauer & Baer, 2012). An interpretation of such findings could provide the theory that once BPD individuals are upset, they are more likely to lash out due to feeling unable to tolerate any further distress. This supports the high baseline of emotional intensity theory proposed in earlier discussions. Linehan (1993) suggests that persons with BPD are slower than others to return to an emotional baseline following a provocation, which leads to the interpretation that BPD individuals have more difficulty detaching from rumination amidst the cascading cycle.

BPD individuals appear to require a more intensive and focused approach to detach from rumination and return to an affective baseline, as encouraging cognitive reappraisal or typical methods of distraction are often inefficient (Selby & Joiner, 2009). The clinical implications of such mental states are worrisome, as elevated rumination, negative emotion, and BPD symptoms were found to prospectively predict the occurrence of a dysregulated behavior within the next 2 to 3 hours (Selby & Joiner, 2013). What can be done to prevent this from happening?

As to what initiates the development of such a cycle, current literature has yet to clearly identify what risk factors are more likely to undergo such a process. As emotion regulation and interpersonal difficulties are so central to BPD symptomatology, they are likely to play key roles. However, the extent to which their respective influence has on the rumination cycle and how long the effects of the rumination induction lasted has yet to be determined (Selby, Anestis, Bender, & Joiner, 2009). The well-documented evidence for the detrimental effects of rumination beg the question; what risk factors are more likely to initiate rumination and thus the Cascade Cycle?

CHAPTER III

CURRENT STUDY AIMS

While there are many psychotherapy approaches that touch on ruminative processes in psychopathology, none have been studied specifically in BPD populations. While current literature findings show rumination to be maladaptive and an integral piece of Selby's Cascade Model, there are no current studies targeting the different triggers of the ruminative process. The present research was inspired by previous literature suggesting that future studies investigate decreases in rumination as a mechanism of change in therapy and whether explicit targeting of rumination is helpful in treating BPD (Selby, Anestis, Bender, & Joiner, 2009; Baer & Sauer, 2011). A study by Elices et al. (2012) examined emotional responses in BPD populations after viewing emotion-eliciting films, and found that emotional dependence scenes produced a heightened subjective reactivity, but they did not compare such reactions to other forms of stimuli. Additional studies have found that BPD characteristics of emotional distress are most

commonly characterized by interpersonal events associated with social rejection or abandonment (Stiglmayr et al., 2005; Dixon-Gordon, Yiu, & Chapman, 2013), and as such commonly exhibit less trust and cooperation in social exchange games (King-Casas et al., 2008). Even still, these studies fail to address how differing types of stressors may have differing impacts on ruminative responses.

The present study exposed participants to differing genres of stressors in hopes of delineating whether they have divergent effects on ruminative responses. If discrepancies exist, i.e. interpersonal conflicts elicit a more intensive ruminative process than emotional cues from non-interpersonal content, then psychotherapies can hone their aim at such triggers to improve efficacy in treatment. By assessing differences in rumination after exposure to various triggers, core symptoms such as interpersonal issues and emotion regulation problems could be more effectively addressed. The present study will examine the relationship between rumination and distress in those with BPD, with an additional goal of determining whether the form of stimuli igniting the rumination process provides significant differences in effects.

The present study aims to determine whether 1) rumination tendencies are predictive of distress, particularly for those with elevated BPD symptoms, 2) rumination tendencies will differ after exposure to negative interpersonal interactions (e.g. ostracism during Cyberball) compared to experiencing non-interpersonal stimuli (e.g. sad film, sad music), and 3) emotional dysregulation is predictive of rumination tendencies.

I am hopeful that the findings of my study will assist in improving empirically supported methods for treating BPD such as dialectical behavior therapy (Linehan, 1993), psychodynamic therapies (Bateman & Fonagy, 2008), and rumination-focused cognitive–

behavioral therapy (Watkins et al., 2007). The hope is that by highlighting encounters that trigger maladaptive rumination processes, and thus which factors exacerbate rumination vulnerabilities, psychotherapy techniques such as DBT and CBT can hone their focus to augment treatment efficacy. While the present sample consists mainly of nonclinical individuals exhibiting BPD symptoms, research suggests that nonclinical adults with BPD features present a level of dysfunction that is severe enough to warrant further study (Trull, 1995).

3.1 *Hypotheses*

H1: Rumination tendencies will predict the distress experienced by those with BPD traits.

H2: Participants will be more likely to ruminate after a negative interpersonal interaction than after exposure to a non-interpersonal stimulus.

H3: Emotional dysregulation will be predictive of rumination tendencies.

CHAPTER IV

METHODS

4.1 Participants

One hundred and twenty-seven participants from the greater Cleveland area served as participants. The age of participants ranged from 18-63 ($M = 25.00$, $SD = 10.09$), with 64% of the sample consisting of female participants ($n=82$). Roughly half of the participants were undergraduate students at Cleveland State University ($n=61$), while the rest consisted of those residing in the greater Cleveland area that had responded to an advertisement either seen on Craigslist.com or in local outpatient centers. Interested potential subjects filled out an online screening measure intending to reveal the existence of BPD traits. Twenty-one participants endorsed clinical levels of BPD symptoms (see 4.2.3)

4.2 Measures

4.2.1 Demographics

Demographic Questionnaire -- A 5-item measure that collects information on subjects' age, sex, racial & ethnic background, country of origin, and years/generations in the US.

4.2.2 Emotion Regulation

Difficulties in Emotion Regulation Scale (DERS) – A 36-item measure examining an individual's patterns of emotional regulation difficulties. Participants make responses via 5-point Likert scale to such prompts as “I am clear about my feelings.” The DERS has been found to have high internal consistency ($\alpha = .93$) (Gratz & Roemer, 2004), and has continued to display high reliability and validity as a measure of emotion regulation (Fowler, Charak, Elhai, Allen, Frueh, & Oldham, 2014).

Self-report mood rating- Reflects participants' ratings of discreet emotions (i.e., happy, sad, scared, & angry) via a 10-point Likert Scale. Results were used to assess pre-task and post-task levels of negative affect.

State Rumination Measure– Reflects the participants' use of rumination strategies via a 10-point Likert scale. These ratings were used to assess pre-task and post-task levels of state rumination.

4.2.3 Psychopathology

Personality Assessment Inventory Borderline Scale (PAI-Bor) – A subscale of the PAI consisting of 24 questions assessing the presence of Borderline Personality features. A raw score cutoff of 38 was used as a clinical threshold, with those scoring higher than 38 being deemed to possess clinical levels of Borderline Personality features (Morey, 1991).

4.3 Experimental Protocol

The experimental protocol involves a baseline affect measure, sad mood inductions, emotion regulation tasks, and an interpersonal exclusion task. Each task was separated by a 2 minute inter-task interval that allowed for the possible feelings of negative affect to return to baseline levels, thus allowing for a natural affect recovery.

Participants were provided with a baseline measure before listening to a sad music clip to examine how non-interpersonal stressors may influence ruminative processes. Participants then underwent a sad mood induction by listening to a 3.5 minute Sad Music excerpt from Samuel Barber's Adagio for Strings (Clasen, Wells, Ellis, & Beevers, 2013), and watched a 2.5 minute clip from the movie "The Champ" (Sad Film clip) (Gross & Levenson, 1995). Participants were then oriented to the Cyberball task (see Appendix C).

In the 5-minute Cyberball task, participants were told they were playing against two other participants ("players") who were taking part in a similar study at other participating universities. They then played a ball catching game using computerized avatars for the other two "players" during which the two "players" progressively began to exclude the subject from receiving the ball. The purpose of the Cyberball task was to

examine whether a ruminative response was extended to interpersonal exclusion (elicited by the Cyberball Task). Data collected while participants listened to the Sad Music clip and Sad Film clip were used to compare whether a ruminative response ensued, and if so, whether this response differs from their reaction to the social exclusion condition.

4.4 Analytic Plan

While large effect sizes between BPD symptoms and rumination tendencies have been reported in the literature ($d=1.86$) (Selby & Joiner, 2013), no study to date has examined the relationship between state rumination and BPD, nor with state rumination and emotion dysregulation. Therefore, we based our power analysis on the feasibility of recruiting a sample of affected participants based on financial and logistic constraints. Our sensitivity analysis showed that a sample of $N=40$ is sufficient to detect small-to-medium effect size ($f^2 = .035$) across study hypothesis at a power = .80 and an $\alpha=.05$. As we were able to successfully recruit 127 participants, we were able to greatly exceed such requirements.

H1: A series of hierarchical regressions models were fit to assess the effects of how rumination, BPD and their combination affect distress. The present study defines distress as the difference between pre-task negative affect and post-task negative affect. In the first step of these models, post-task distress was regressed against pre-task distress to produce a residualized distress score.

The first model utilized participants' negative affect post-sad-music induction as the dependent variable. Negative affect ratings gathered prior to the sad music condition

were entered into stage one of the regression, while state ruminations and PAI-Bor scores were entered in step two to examine how residualized changes influence the main effects of state rumination and BPD symptoms. The interaction between state music rumination and PAI-Bor scores were entered in step three to examine the combined effects of state rumination and BPD.

The second model utilized the negative affect participants reported after exposure to the sad film as the dependent variable. The negative affect ratings gathered prior to the sad film condition were entered as predictors into step one of the regression, state ruminations and PAI-Bor scores were entered in step two, and the interaction between state film rumination and PAI-Bor scores were entered in step three.

The third model utilized the negative affect participants reported after the Cyberball task as the dependent variable. Negative affect ratings gathered prior to the Cyberball task were entered as predictors into step one of the regression, state ruminations and PAI-Bor scores were entered in step two, and the interaction between Cyberball rumination and PAI-Bor scores were entered for step three.

H2: A repeated measure ANOVA was run to determine whether participants are more likely to ruminate after a negative interpersonal interaction than after exposure to a non-interpersonal stimulus. Within subject factors consisted of the task type (i.e., sad music, sad film, and Cyberball). There were no between subject factors, however BPD traits were used as a continuous variable to assess their influence on ruminative tendencies.

H3: A repeated measure ANOVA was run to determine whether emotional dysregulation was predictive of rumination tendencies. Within subject factors consisted of the task type (i.e., sad music, sad film, and Cyberball). There were no between subject factors.

CHAPTER V

RESULTS

5.1 Manipulation Check

A series of dependent samples t-tests were conducted to determine whether mood induction procedures were successful in inducing negative mood states. Means, standard deviations, and p-values are presented in Table I. Results indicate that our manipulation was successful in increasing negative mood states across the three conditions.

5.2 Descriptive Analyses

Bivariate correlations are presented in Table II. Pearson correlations were conducted to examine bivariate correlations between all variables. Age and sex were found to be uncorrelated with rumination scores and thus were not entered as potential covariates in analyses (see Table II). Rumination scores reported after the interpersonal condition (i.e. Cyberball) was significantly related to state rumination reported after the

sad music condition, $r = .20$, $p < .05$; but not for the sad film condition. However, elevated levels of state rumination after exposure to sad music was significantly related to increased state rumination after sad film exposure, $r = .28$, $p < .01$. Higher levels of BPD traits were found to be positively related to Cyberball state rumination, $r = .26$, $p < .01$; and emotion dysregulation scores via the DERS $r = .64$, $p < .01$.

5.3 Hypothesis Testing

The first aim of the study was to determine whether rumination tendencies are predictive of the distress experienced by those with BPD traits. Three hierarchical regression models were run to assess the effects of rumination, BPD and their interaction predict change in negative affect across the sad music, sad film, and Cyberball mood induction tasks.

The first model examined how the effects of rumination, BPD and their interaction predict change in negative affect across the sad music condition. Pre-task negative affect was regressed on post-task negative affect in the first step, BPD and state rumination were added in the second step, and the interaction of BPD and state rumination was added in the third step. While pre-task negative affect robustly predicted negative affect following the sad music clip across the three steps, only state rumination emerged as a significant predictor of post-music negative affect, $\beta = .23$, $t(118) = 3.44$, $p < .01$ (see Table III). Contrary to expectation, BPD failed to significantly predict post-sad music negative affect both alone and in the moderation of the effect of state rumination.

The second model examined how the effects of rumination, BPD and their interaction predict change in negative affect across the sad film condition. As in the first

model, pre-task negative affect was regressed on post-task negative affect in the first step, BPD and state rumination were added in the second step, and the interaction of BPD and state rumination was added in the third step. As in the first model, pre-task negative affect robustly predicted negative affect following the sad film clip across the three steps, however only state rumination emerged as a significant predictor of post-film negative affect, $\beta = .35$, $t(118) = 5.57$, $p < .01$ (see Table IV). Contrary to expectation, BPD again failed to significantly predict post-sad film negative affect both alone and in the moderation of the effect of state rumination.

The third model examined how the effects of rumination, BPD and their interaction predict change in negative affect across the interpersonal (Cyberball) condition. As in the prior two models, pre-task negative affect was regressed on post-task negative affect in the first step, BPD and state rumination were added in the second step, and the interaction of BPD and state rumination was added in the third step. As in the previous two models, pre-task negative affect robustly predicted negative affect following the sad film clip across the three steps. Interestingly, in contrast to previous models, only BPD traits emerged as a significant predictor of post-Cyberball negative affect, $\beta = .16$, $t(118) = 2.26$, $p < .05$ (see Table V). However, BPD again failed to significantly predict post-sad film negative affect both alone and in the moderation of the effect of state rumination.

H2: Participants are more likely to ruminate after a negative interpersonal interaction than after exposure to a non-interpersonal stimulus.

As hypothesized, a repeated measure ANOVA revealed significant differences in state rumination levels as a function of task, $F(2, 240) = 9.76, p < .01, \eta^2 = .075$, and a task by BPD interaction that was significant at a trend level $F(2, 240) = 2.99, p = .052, \eta^2 = .024$. Follow-up analyses revealed that participants experienced significantly lower levels of rumination after Cyberball ($M=4.63, SD= 2.79$) compared to the sad music condition ($M=5.70, SD= 2.93$), $F(1, 120) = 10.23, p < .01, \eta^2 = .079$, and the sad film condition ($M=6.15, SD= 2.98$), $F(1,120) = 17.29, p < .01, \eta^2 = .126$. Interestingly, while participants' reported levels of rumination were lower amidst sad music condition than the sad film condition, these differences were not significant $F(1, 120) = 1.30, p > .05$.

Follow-up analyses addressing the interaction of BPD traits among the conditions revealed that BPD symptoms were associated with significant trend levels of state rumination after the Cyberball task relative to sad music, $F(1,120) = 3.33, p = .07, \eta^2 = .027$, and significant levels following the sad film, $F(1,120) = 5.22, p < .05, \eta^2 = .042$. Contrary to expectation, rumination did not differ as a function of BPD across the sad music and sad film clips, $F(1,120) = .316, p = .58$. For illustrative purposes, rumination levels are presented as a function task and clinical levels of BPD symptoms on the PAI-Bor (see Figure 1). Further analysis of post-Cyberball mean negative affect ratings demonstrate that participants with subclinical levels of BPD traits reported significantly lower levels of negative affect ($M=5.38, SD = 3.43$) than participants endorsing clinical levels of BPD symptoms ($M = 7.10, SD = 4.42$), $t(120) = 1.98, p = .05$.

H3: Emotional dysregulation is predictive of rumination tendencies.

As hypothesized, a repeated measures ANOVA revealed that emotion dysregulation was predictive of rumination tendencies, irrespective of the interpersonal nature of the task $F(1,53) = 12.06, p < .01, \eta^2 = .185$. Indeed, the robust association between emotion dysregulation and rumination across tasks was maintained event when controlling for BPD symptoms, $F(1, 52) = 8.20, p < .01, \eta^2 = .136$. Thus, those who endorsed high levels of emotion dysregulation reported engaging in state rumination across the sad music, sad film, and Cyberball tasks.

CHAPTER VI

DISCUSSION

The present study examined the relationship between BPD symptoms and state rumination in response to non-interpersonal and interpersonal negative mood inductions. The present study was informed by Selby and Joiner's (2009) Emotional Cascade Model of BPD, which posed that rumination is a key mechanism by which BPD is related to emotional distress and emotion dysregulation. As research conducted by Sauer and Joiner (2012) has shown that BPD individuals are increasingly susceptible to stimuli grounded in negative content, this study examined how exposing participants to sad music, a sad film, and a social exclusion task may induce divergent effects on ruminative responses. As viewing emotion-eliciting films have been found to produce a heightened subjective reactivity in BPD populations (Elices et al., 2012), and BPD characteristics of emotional distress are most commonly characterized by interpersonal events associated with social rejection (Stiglmayr et al., 2005; Dixon-Gordon, Yiu, & Chapman, 2013), the overall goal of this study was to expand upon prior research by incorporating a direct comparison

of interpersonal stimuli versus non-interpersonal stimuli within the same study to determine whether the context of the stimuli had different effects on emotion regulation and ruminative responses.

Rumination is known to be prominent in persons with borderline personality disorder and is correlated with symptom severity (Baer & Sauer, 2011). Thus, the first aim of the present research was to determine whether rumination tendencies are predictive of distress, defined by this study as the difference between pre- and post-task negative affect. The second aim of this study was to determine if rumination tendencies will differ after being socially ostracized during a game of Cyberball compared to watching a sad film or listening to sad music. The third and final aim of the study was to determine if emotional dysregulation is predictive of rumination tendencies.

The first hypothesis was that rumination tendencies predict the distress experienced by those with BPD traits. Contrary to expectation, results indicated that state rumination, independent of BPD, significantly predicted increased negative affect following the sad music and sad film mood inductions, and that BPD symptoms, rather than rumination, predicted negative affect following the Cyberball task. In all models, BPD symptoms did not alter the association between state rumination and negative affect. These findings are interesting, in that they suggest BPD symptoms are not contingent on negative mood induction per se, but rather increase susceptibility to negative interpersonal interactions. Indeed, consistent with prior literature on rumination, the results suggest that rumination prolonged and intensified negative moods (Baer & Sauer, 2011; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008).

This pattern of findings is consistent with literature that links affective instability among those with BPD with interpersonal problems (Russell et al., 2007). This pattern of findings also fails to support the Cascade Model. While the Cascade Model poses that the link between BPD and emotional distress and dysregulation is accounted for by rumination, our findings suggest that BPD, rather than rumination, accounts for increased levels of distress, thus overshadowing the effects of rumination in regard to interpersonal conflict. These findings suggest that future research should focus on interpersonal interactions when assessing key variables that predict distress among those with BPD symptoms. Further, they suggest that rumination may be a general risk factor for distress, and not a mechanism through which those with BPD experience emotion dysregulation.

While moderation analyses were used to examine whether BPD symptoms exacerbate rumination, an alternate model could examine the mediating role of rumination between BPD and negative affect. While this model was considered, its underlying assumptions that BPD should correlate with state rumination were not supported for two of the three mood induction procedures. Further, while rumination and BPD symptoms significantly correlated after Cyberball, models that examined both predictors simultaneously showed that BPD, rather than rumination, was associated with distress. Thus state rumination could not have mediated the effects of BPD symptoms on distress.

The second hypothesis, proposed that participants will be more likely to ruminate after a negative interpersonal interaction than after exposure to a non-interpersonal stimulus. Contrary to expectation, rumination levels did not differ across the two sad mood induction procedures, and decreased following the interpersonal exclusion task.

These findings were qualified by BPD symptoms: in contrast to those with low BPD symptoms who evidenced the greatest levels of rumination following the sad film and lowest levels following the exclusion task, those with elevated BPD symptoms ruminated the most after listening to sad music, and did not reduce their rumination following interpersonal exclusion.

While the relationship between BPD symptoms and rumination following interpersonal exclusion is consistent with the extant literature (e.g., Miano, Fertuck, Arntz & Stanley, 2013), the divergent pattern of BPD effects on rumination across the sad music and film clips tasks is curious. While no studies to this author's knowledge have examined the effects of BPD on affect following interpersonal vs. non-interpersonal negative mood induction, the findings suggest that those with BPD symptoms may process sadness due to interpersonal loss differently than their healthy peers. This possibility warrants further investigation in future studies.

The third hypothesis was that emotion dysregulation is predictive of rumination tendencies. Indeed, emotion dysregulation levels robustly predicted state rumination irrespective of the nature of the mood induction procedure. Follow-up analyses not reported in this thesis revealed that the strong association between emotion dysregulation and state rumination levels was maintained even when controlling for BPD symptoms. These findings are consistent with literature posing rumination as a maladaptive emotion regulation response (e.g., Nolen-Hoeksema, et al., 2008), and suggest that regardless of BPD traits, having emotion regulation difficulties is linked to rumination and the intensification of negative affect. While this study is not positioned to examine whether rumination tendencies begin before emotion regulation difficulties, findings from this

study do suggest that treatment providers should consider both as potential targets of treatment.

6.1 Limitations

The findings of this study should be considered with several limitations. The study used a community sample consisting of participants who exhibit BPD traits. While research suggests that nonclinical adults with BPD features present a level of dysfunction that is severe enough to warrant further study (Trull, 1995), results may differ if an entirely clinical sample is utilized. As the current study was only able to examine 21 participants with above-threshold levels of BPD symptoms, a larger BPD sample size would likely increase the statistical power of findings. Second, the present study did not control for comorbid disorders in the models. Given that BPD is highly comorbid with disorders that are linked to ruminative tendencies (e.g., Major Depressive Disorder), it is feasible that our results are confounded by comorbid conditions. Future studies should rule out the effects of comorbid conditions on rumination. Third, the present study did not control for trait rumination. Accounting for trait rumination could possibly affect the findings of this study. Lastly, as the present study was conducted within the frame of a larger experimental protocol, the order in which the experimental stimuli were presented was unable to be counterbalanced.

To assess whether order effects influenced pre-task levels of negative affect, a repeated measures ANOVA analyzed mean negative affect ratings prior to each condition. Results suggested that pre-task negative affect levels differed across the three tasks, $F(2,121) = 3.47$, $p = .04$, $\eta^2 = .05$. Follow-up analyses revealed that pre-music ($M = 4.64$, $SD = 3.24$) and pre-Cyberball levels of negative affect ($M = 4.48$, $SD = 2.56$) were

significantly lower than pre-film negative affect ($M = 4.92$, $SD = 3.43$), $F(1, 121) = 4.37-5.49$, $ps < .05$, $\eta^2 = .035-.043$. These findings suggest that order effects may have been present in the data, although the magnitude of their effects appears to be small.

6.2 Recommendations for Future Research

The design of this study reveals several limitations that should be addressed in future research. First, utilizing an entirely clinical sample consisting of participants diagnosed with Borderline Personality Disorder could improve the power of the results of this study. Second, assessing for comorbid disorders is recommended to control for confounding effects on rumination processes. Third, including a measure of trait rumination may improve upon the findings of this study. Fourth, counterbalancing the order in which stimuli was presented may be helpful in controlling for possible order effects. Lastly, while this study proposed BPD would exacerbate rumination, an alternate model might look at a mediation model across stimuli.

6.3 Strengths and Clinical Implications

The present research was able to expose participants to differing types of stressors within the same study in hopes of producing direct comparisons delineating whether the content of the risk factor has divergent effects on ruminative responses. By assessing differences in rumination after exposure to various triggers, core symptoms such as interpersonal issues and emotion regulation difficulties can be more effectively addressed. I am hopeful that the findings of my study will assist in improving empirically supported methods for treating BPD such as dialectical behavior therapy (Linehan, 1993),

psychodynamic therapies (Bateman & Fonagy, 2008), and rumination- focused cognitive-behavioral therapy (Watkins et al., 2007). The hope is that by highlighting factors that increase vulnerability to maladaptive rumination processes, psychotherapy techniques can hone their focus to augment treatment efficacy by preventing Selby and Joiner's Cascade Cycle from developing.

Irrespective of BPD traits, poor emotion regulation was shown to increase the likelihood of a ruminative response taking place. Thus, therapeutic providers who aim to improve emotion regulation strategies early in treatment could facilitate the recovery process regardless of diagnosis. However, as BPD traits increase the likelihood that poor emotion regulation strategies are utilized, individuals endorsing BPD traits are at an even greater risk for rumination. As the present research has shown that interpersonal stress is more likely to initiate a ruminative response among BPD individuals, therapeutic providers should place an increased focus on improving interpersonal effectiveness.

Table I. *Dependent Samples T-Tests Regarding Efficacy of Mood Induction Procedures*

	Negative Affect (Pre)		Negative Affect (Post)		t-test
	M	SD	M	SD	
Sad Music	4.66	3.23	5.37	3.42	2.85**
Sad Film	4.93	3.23	8.95	4.13	
	13.92**				
Cyberball	4.48	2.56	5.67	3.66	4.78**

**p < .01

Table II. *Intercorrelations Between Age, Gender, and Study Variables*

Measure	1	2	3	4	5	6	7
1. Age	-						
2. Gender	.20*	-					
3. Sad MusicRum	-.11	.00	-				
4. Sad FilmRum	-.07	-.09	.28**	-			
5. CyberballRum	.10	.12	.20*	.12	-		
6. DERS	-.33*	-.17	.18	.28*	.40**	-	
7. PAI-Bor	-.04	-.13	.06	-.01	.27**	.64**	-

Note. The Personality Assessment Inventory-Borderline Scale was abbreviated to PAI-Bor, and the Difficulties in Emotion Regulation Scale was abbreviated to DERS.

**p < .01

* p < .05

Table III. Moderation analyses of BPD and state rumination effects on negative affect following sad music

	Step 1			Step 2			Step 3		
	B	SE	β	B	SE	β	B	SE	β
Pre- Test NA	.66	.07	.65***	.66	.07	.65***	.66	.07	.65***
PAI-Bor Score				-.01	.02	-.03	-.01	.02	-.03
State Rumination				.26	.08	.23**	.26	.08	.23**
PAI-Bor*State Rumination							-.001	.01	-.02
R^2		.42			.47			.47	
ΔR^2		.42**			.05**			.00	

Note. The Personality Assessment Inventory-Borderline Scale was abbreviated to PAI-Bor.

***p < .001

**p < .01

Table IV. Moderation analyses of BPD and state rumination effects on negative affect following the sad film

	Step 1			Step 2			Step 3		
	B	SE	β	B	SE	β	B	SE	β
Pre- Test NA	.79	.08	.65***	.77	.08	.63***	.76	.08	.63***
PAI-Bor Score				-.01	.02	-.04	-.01	.02	-.03
State Rumination				.48	.09	.35***	.48	.09	.35***
PAI-Bor*State Rumination							.00	.01	.02
R^2		.42			.54			.54	
ΔR^2		.42**			.12**			.00	

Note. The Personality Assessment Inventory-Borderline Scale was abbreviated to PAI-Bor.

***p < .001

**p < .01

Table V. Moderation analyses of BPD and state rumination effects on negative affect following Cyberball

	Step 1			Step 2			Step 3		
	B	SE	β	B	SE	β	B	SE	β
Pre- Test NA	.95	.10	.66***	.86	.10	.60***	.86	.10	.60***
PAI-Bor Score				.04	.02	.16*	.04	.02	.16*
State Rumination				.17	.09	.13	.17	.09	.13
PAI-Bor*State Rumination							.00	.01	-.02
R^2		.44			.49			.49	
ΔR^2		.44**			.05*			.00	

Note. The Personality Assessment Inventory-Borderline Scale was abbreviated to PAI-Bor.

***p < .001

**p < .01

*p < .05

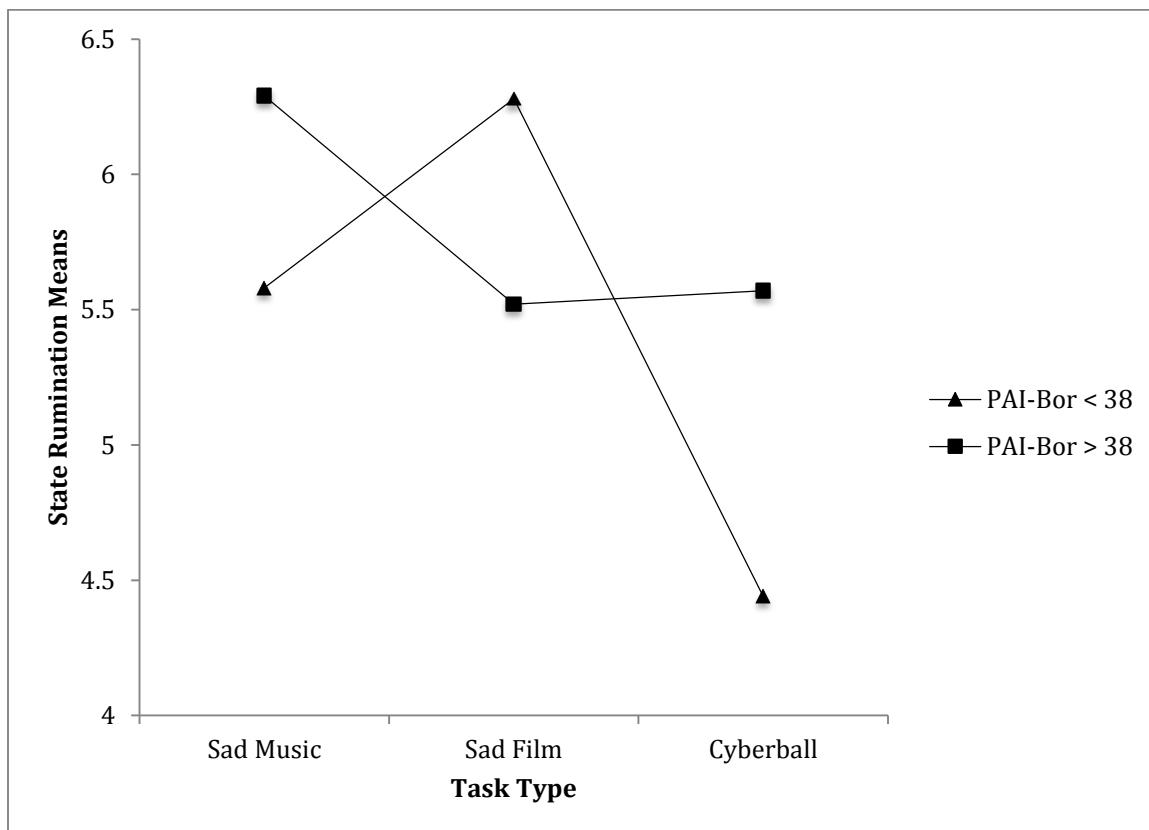


Figure 1. State Rumination across Mood Induction Procedures and Clinical BPD Levels.

Note. The Personality Assessment Inventory-Borderline Scale was abbreviated to PAI-Bor.

References

- Baer, R. A., & Sauer, S. E. (2011). Relationships between depressive rumination, anger rumination, and borderline personality features. *Personality Disorders: Theory, Research, And Treatment, 2*(2), 142-150.
- Bender, D. S., & Skodol, A. E. (2007). Borderline personality as a self-other representational disturbance. *Journal of Personality Disorders, 21*(5), 500–517.
- Brodsky, B. S., Groves, S. A., Oquendo, M. A., Mann, J. J., & Stanley, B. (2006). Interpersonal precipitants and suicide attempts in borderline personality disorder. *Suicide And Life-Threatening Behavior, 36*(3), 313-322.
- Clasen, P. C., Wells, T. T., Ellis, A. J., & Beevers, C. G. (2013). Attentional biases and the persistence of sad mood in major depressive disorder. *Journal of Abnormal Psychology, 122*(1), 74-85.
- Dixon-Gordon, K. L., Yiu, A., & Chapman, A. L. (2013). Borderline personality features and emotional reactivity: The mediating role of interpersonal vulnerabilities. *Journal of Behavior Therapy and Experimental Psychiatry, 44*(2), 271–278.
- Donegan, N. H., Sanislow, C. A., Blumberg, H. P., Fulbright, R. K., Lacadie, C., Skudlarski, P., & ... Wexler, B. E. (2003). Amygdala hyperreactivity in borderline personality disorder: Implications for emotional dysregulation. *Biological Psychiatry, 54*(11), 1284-1293.
- Duberstein, P. R., & Conwell, Y. (1997). Personality disorders and completed suicide: A methodological and conceptual review. *Clinical Psychology: Science and Practice, 4*, 359–376.
- Elices, M., Soler, J., Fernández, C., Martín-Blanco, A., Portella, M. J., Pérez, V., ... Pascual, J. C. (2012). Physiological and self-assessed emotional responses to emotion-eliciting films in borderline personality disorder. *Psychiatry Research, 200*(2-3), 437–443.
- Fowler, J. C., Charak, R., Elhai, J. D., Allen, J. G., Frueh, B. C., & Oldham, J. M. (2014). Construct validity and factor structure of the difficulties in emotion regulation scale among adults with severe mental illness. *Journal Of Psychiatric Research, 58*, 175-180.
- Gratz, K., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of Psychopathology and Behavioral Assessment, 26*, 41–54.

- Gross, J., & Levenson, R. (2005). Emotion elicitation using film. *Cognition and Emotion*, *9*(1), 87-108.
- Gunderson, J. G., & Lyons-Ruth, K. (2008). BPD's interpersonal hypersensitivity phenotype: A gene-environment-developmental model. *Journal Of Personality Disorders*, *22*(1), 22-41.
- Herr, N. R., Rosenthal, M. Z., Geiger, P. J., & Erikson, K. (2013). Difficulties with emotion regulation mediate the relationship between borderline personality disorder symptom severity and interpersonal problems. *Personality and Mental Health*, *7*(3), 191–202.
- Hueston, W. J., Mainous, A. G., & Schilling, R. (1996). Patients with personality disorders: Functional status, health care utilization, and satisfaction with care. *The Journal of Family Practice*, *42*, 54–60.
- King-Casas, B., Sharp, C, Lomax-Bream, L., Lohrenz, T., Fonagy, P., & Montague, P. R. (2008). The rupture and repair of cooperation in borderline personality disorder. *Science*. 321(5890), 806-810.
- Kuo, J. R., & Linehan, M. M. (2009). Disentangling emotion processes in borderline personality disorder: Physiological and self-reported assessment of biological vulnerability, baseline intensity, and reactivity to emotionally evocative stimuli. *Journal Of Abnormal Psychology*, *118*(3), 531-544.
- Lenzenweger, M. F. (2008). Epidemiology of personality disorders. *Psychiatric Clinics of North America*, *31*, 395– 403.
- Linehan, M. M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. New York: Guilford Press.
- Livesley, W. J. (2005). Principles and Strategies for Treating Personality Disorder. *The Canadian Journal Of Psychiatry / La Revue Canadienne De Psychiatrie*, *50*(8), 442-450.
- Miano, A, Fertuck, E., Arntz, A., & Stanley, B. (2013). Rejection sensitivity is a mediator between borderline personality disorder features and facial trust appraisal. *Journal of Personality Disorders*, *27*(4), 442–456.
- Morey, L. C. (1991). *The Personality Assessment Inventory (PAI) professional manual*. Odessa, FL: Psychological Assessment Resources.
- Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology*, *100*, 569–582.

- Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking rumination. *Perspectives On Psychological Science (Wiley-Blackwell)*, 3(5), 400-424.
- Papageorgiou, C., & Wells, A. (2001). Metacognitive beliefs about rumination in recurrent major depression. *Cognitive and Behavioral Practice*, 8, 160– 164.
- Russell, J. J., Moskowitz, D. S., Zuroff, D. C., Sookman, D., & Paris, J. (2007). Stability and variability of affective experience and interpersonal behavior in borderline personality disorder. *Journal of Abnormal Psychology*, 116, 578–588.
- Sauer, S. E., & Baer, R. A. (2012). Ruminative and mindful self-focused attention in borderline personality disorder. *Personality Disorders: Theory, Research, And Treatment*, 3(4), 433-441.
- Selby, E. A., Anestis, M. D., Bender, T. W., & Joiner, T. J. (2009). An exploration of the emotional cascade model in borderline personality disorder. *Journal Of Abnormal Psychology*, 118(2), 375-387.
- Selby, E. A., Anestis, M. D., & Joiner, T. E. (2008). Understanding the relationship between emotional and behavioral dysregulation: Emotional cascades. *Behaviour Research and Therapy*, 46, 593–611.
- Selby, E. A., & Joiner, T. J. (2013). Emotional cascades as prospective predictors of dysregulated behaviors in borderline personality disorder. *Personality Disorders: Theory, Research, And Treatment*, 4(2), 168-174.
- Selby, E. A., & Joiner, T. J. (2009). Cascades of emotion: The emergence of borderline personality disorder from emotional and behavioral dysregulation. *Review of General Psychology*, 13 (3), 219-229.
- Sieswerda, S., Arntz, A., Mertens, I., & Vertommen, S. (2007). Hypervigilance in patients with borderline personality disorder: Specificity, automaticity, and predictors. *Behaviour Research and Therapy*, 45, 1011–1024.
- Stepp, S. D., Smith, T. D., Morse, J. Q., Hallquist, M. N., & Pilkonis, P. A. (2012). Prospective associations among borderline personality disorder symptoms, interpersonal problems, and aggressive behaviors. *Journal of Interpersonal Violence*.
- Stiglmayr, C. E., Grathwol, T., Linehan, M. M., Ihorst, G., Fahrenberg, J., & Bohus, M. (2005). Aversive tension in patients with borderline personality disorder: A computer-based controlled field study. *Acta Psychiatria Scandinavia*, 111, 372-379.
- Thompson, R. A. (1994). Emotion regulation: A theme in search of definition. In N. A. Fox (Ed.), *The development of emotion regulation and dysregulation: Biological and*

behavioral aspects. *Monographs of the Society for Research in Child Development*, 59, 25–52.

Trull, T. (1995). Borderline personality disorder features in nonclinical young adults: Identification and validation. *Psychological Assessment*, 7, 33–41.

Wingenfeld, K., Mensebach, C., Rullkoetter, N., Schlosser, N., Schaffrath, C., Beblo, T., & Driessen, M. (2009). Brief report: Relationship between coping with negative life-events and psychopathology: Major depression and borderline personality disorder. *Psychology & Psychotherapy: Theory, Research & Practice*, 82(4), 421-425.

Wingenfeld, K., Mensebach, C., Rullkoetter, N., Schlosser, N., Schaffrath, C., Woermann, F. G., & ... Beblo, T. (2009). Attentional bias to personally relevant words in borderline personality disorder is strongly related to comorbid posttraumatic stress disorder. *Journal Of Personality Disorders*, 23(2), 141-155.

World Health Organization. (2015). Retrieved from

<http://www.who.int/about/mission/en/>

Zimmerman, M., Rothschild, L., & Chelminski, I. (2005). The prevalence of DSM-IV personality disorders in psychiatric outpatients. *The American Journal of Psychiatry*, 162, 1911–1918.

APPENDICES

Appendix A: Demographic Questionnaire

1. Age (in years): _____

2. Sex (circle one): Male Female

3. Year in School (circle one):

Freshman

Sophomore

Junior

Senior

4. Ethnicity

Please circle your ethnicity(ies)/race(s)

African-American/Black (non Hispanic)

Caucasian/White (non Hispanic)

Hispanic/Latino(a)

Middle Eastern

Native American/American Indian/Eskimo/Aleut

Native Hawaiian/Pacific Islander

South Asian/East Indian

Southeast Asian

Other (please describe): _____

Multiracial (please describe): _____

5. Country of Origin: _____

If country of origin is the US: Including you, how many generations of your family have lived in the US?

1

2

3

4 or more

If country of origin was not the U.S., how many years have you resided in the US?

Appendix B: Affect and Rumination Ratings

Self-report mood rating- reflect participants' rating discreet emotions (i.e., happy, sad, scared, & angry) via an 10-point Likert Scale.

State Rumination Measure – reflect participants' use of rumination, reappraisal, avoidance, and acceptance emotion regulation strategies via a 10-point Likert scale.

Rumination:

- I found it hard to not think about the way the music made me feel. (S5)
- I found it hard to not think about the way the movie made me feel. (S7 & S9)
- I found it hard to not think about the way the game made me feel. (S13-S15)

Appendix C: Cyberball

Cyberball Game. The screenshot below reflects the participant's view during the Cyberball game. The participant uses the mouse to select the "player" to whom they wish to throw the ball. The game is divided into 3 blocks. During the first block, the participant has a 50% chance of receiving the ball. During the second block, the participant has a 25% chance of receiving the ball, and 0% chance of receiving the ball during the third block of the game.



You have the ball! Click the picture of the player you wish to throw it to.