EMOTIONAL RESPONSES TO SOCIAL REJECTION AND FAILURE AMONG PERSONS WITH BORDERLINE PERSONALITY FEATURES

by

Kristy Nichelle Walters
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APPROVAL

Name: Kristy Nichelle Walters

Degree: Master of Arts (Psychology)

Title of Thesis: Emotional Responses to Social Rejection and Failure
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Chair: Dr. Thomas Spalek
                        Assistant Professor

                        Dr. Alexander Chapman
                        Senior Supervisor
                        Assistant Professor

                        Dr. Kevin Douglas
                        Supervisor
                        Assistant Professor

External Examiner: Dr. Jessica Tracy
                        Assistant Professor
                        Department of Psychology
                        University of British Columbia

Date Defended :   August 7, 2008

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ABSTRACT

Despite widespread theorizing regarding the role of heightened emotionality in the difficulties of persons with borderline personality disorder (BPD), few studies have examined whether persons with BPD features experience heightened emotional reactions to emotional stimuli in the laboratory. Existing research suggests that persons with BPD may experience heightened reactivity primarily to interpersonal stressors. Thus, for the present study, a new social rejection laboratory stressor was developed. Undergraduates with high (n=30) or low (n=44) BPD features were randomly assigned to either an academic failure or the social rejection emotion induction. High-BPD participants reported a greater increase in negative emotions generally, and shame and anger specifically, following social rejection than low-BPD participants. These findings suggest that rather than global reactivity, persons with BPD features may only demonstrate heightened emotional reactivity in certain contexts and for particular emotions.

Keywords: Borderline Personality Disorder; Emotional Reactivity; Stress; Interpersonal Stressors

Subject Terms: Borderline Personality Disorder; Emotions, Emotion Research; Emotion Induction

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INTRODUCTION

Borderline personality disorder (BPD) is characterized by maladaptive coping behaviours and poses a serious concern in terms of public health. Prevalence rates of BPD range from between 0.8% to 2.0% in the general population (Skodol et al., 2002). Despite this relatively low prevalence, up to 38% of all people who commit suicide meet diagnostic criteria for BPD (Linehan, Rizvi, Shaw-Welch, & Page, 2000). Further, BPD patients account for 8-10% of psychiatric outpatients and 14-20% of all psychiatric inpatients (Kroll, Sines, & Martin, 1981; Widiger & Frances, 1989; Widiger & Weissman, 1991).

The high rate of health care service utilization in this population is likely related to the extremely high rates of parasuicidal behaviour and other maladaptive behaviours in which people with BPD engage. In particular, rates of deliberate self-harm among individuals with BPD (60-80%) are substantially higher than those of the general population (Shearer, 1994, Shearer, Peters, Quaytman, & Ogden, 1990; Soloff, Lis, Kelly, Cornelius, & Ulrich, 1994). Furthermore, 75% of all persons diagnosed with BPD attempt suicide at some point in their life, and 8-10% die by suicide (Skodol et al., 2002). This rate of completed suicide is 50 times higher than that of the general population (Workgroup on Borderline Personality Disorder, 2001). Additionally, compared to patients without BPD, those with BPD were 4.3 times more likely to have abused alcohol and 8.7 times more likely to abuse substances other than alcohol or cannabis (Skodol, Oldham, & Gallaher, 1999). Behaviours

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such as suicide attempts (Baumeister, 1990), deliberate self-harm (Chapman, Gratz, & Brown, 2006) and substance abuse (Marlatt, 1994) have been conceptualized as strategies to cope with unwanted or distressing emotional experiences.

Emotional Reactivity in BPD

Borderline personality disorder is characterized by symptoms such as emotion dysregulation, negative affectivity, affect instability, impulsivity, interpersonal discord, and identity confusion (American Psychiatric Association, 2000). According to Linehan's (1993) *biosocial theory*, BPD consists of both emotion vulnerability and emotion dysregulation. *Emotion dysregulation* refers to the inability to control or modulate emotional experiences. *Emotion vulnerability* is a temperament-based disposition that involves a low threshold for emotional responding, along with intense and long-lasting responses to emotionally evocative stimuli. This means that people with BPD are more likely to react emotionally to what may seem to others like small or insignificant events (e.g., a look of annoyance on a person's face, a slightly blunt voice-tone) compared with people who do not have BPD. According to this theory, people with BPD also have very strong reactions to emotionally evocative events and take a long time to return to emotional baseline.

The focus of the proposed research is on emotional reactivity in BPD. *Emotional reactivity* has been defined as "the excitability, responsivity, or arousability of the behavioural and physiological systems" Rothbart & Derryberry, 1981, p. 40). There is some evidence that individuals with personality disorders

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in general, and BPD specifically, experience mood states with greater intensity (Farmer, Nash, & Dance, 2004; Larsen, 1987). Individuals with BPD report higher affect intensity in response to negative events than individuals with other personality disorders (Henry, Mitropoulou, & New, 2001; Koenigsberg, Harvey, & Mitropoulou, 2002) or bipolar II disorder (Henry et al., 2001). This heightened affect intensity reported by individuals with BPD may, however, be specific to negative emotions (Levine, Marziali, & Hood, 1997). Research found that persons with BPD reported higher levels of negative affect intensity but similar levels of positive affect intensity when compared to non-BPD controls (Levine et al., 1997). Additionally, studies have found that self-reported negative affect intensity is positively correlated with BPD symptoms (Cheavens, Rosenthal, & Daughters, 2005; Rosenthal, Cheavens, Lejuez, & Lynch, 2005; Yen, Zlotnick, & Costello, 2002). Furthermore, BPD features predicted greater affect intensity in a sample of psychiatric patients (Yen, Zlotnick, & Costello, 2002) as well as in non-clinical samples (Cheavens et al., 2005; Rosenthal et al., 2005).

Persons with BPD and BPD features also show some evidence of specific emotional reactivity with anger and self-conscious emotions. For instance, women with BPD reported higher levels of both trait-like shame- and guilt-proneness, as well as state shame, than women with social phobia and healthy comparison subjects (Rusch et al., 2007). Some researchers have even conceptualized BPD as a chronic shame response – the intense feeling that one will never be good enough (Crowe, 2004). Another study examined cortisol reactivity, which has been linked to the experience of shame, to traumatic and abandonment scripts.

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This study found that BPD patients had enhanced cortisol reactivity, compared to PTSD and control subjects (Elzinga & Bremner, 2002). Additionally, clinicians have argued that shame is the emotion in BPD most strongly linked with chronic suicidality, self-injurious behaviour, anger, and impulsivity (Linehan, 1993; Lester, 1997; Stiglmayr, Grathwol, Linehan, Ihorst, Fahrenberg, & Bohus, 2005) and recent studies have found that shame predicted future engagement in self-harm (Brown, 2003; Brown, Williams, & Collins, 2007).

Several studies have suggested that anger is central to BPD as well. In one study (Gardner, Leibenluft, O'Leary, & Cowdry, 1991), patients with BPD scored significantly higher on the irritability, negativism, resentment, suspicion, and guilt subscales of the Buss-Durkee Hostility Inventory (BDHI; Buss & Durkee, 1957), therefore rating themselves significantly more hostile than did a group of healthy controls. Additionally, adolescents with BPD features were significantly more aggressive than adolescents with major depressive disorder (Horesh, Orbach, Gothelf, Efrati, & Apter, 2003). Furthermore, findings suggest that the emotion regulation strategy of self-punishment may be used to a greater degree among those with BPD compared with individuals with other personality disorders or elevated symptoms of major depression (Rosenthal, Cukrowicz, Cheavesn, & Lynch, 2006). Interestingly, the experience of anger may be related to the experience of shame. For example, shame provokes irrational relative anger and externalization of blame, to defend against feelings of shame (Tagney, 1996; Tangney & Salovey, 1999; Tangney, Wagner, Hill-Barlow, Marschall, & Gramzow, 1996). Given that persons with BPD features have difficulty regulating

troubling emotions, it is possible they are even more likely to resort to defensive anger in attempt to cope with intense shame.

Emotional Reactivity to Stressors

Despite these findings on greater emotional intensity and areas of specific emotional vulnerability (e.g., anger and shame), there is a dearth of research on whether persons with BPD features actually react more strongly to real life stressors compared with controls. It is clear that not only do people with BPD tend to respond to negative events with strong emotional reactions (Levine et al., 1997; Linehan, 1993; Westen, 1998) and have difficulty regulating those strong emotions, they also experience more interpersonal stressors (Tolpin, Gunthert, Cohen, & O'Neill, 2004) and overall negative life events compared to non-BPD controls (Pagano, Skodol, & Stout, 2004; Perry, Lavori, Pagano, & Hoke, 1992; Samuels, Nestadt, Romanoski, & Folstein, 1994). There is, however, only minimal evidence that people with BPD or BPD features are more reactive than controls in response to a specific stressor or negative life event. Empirical findings on reactivity have been mixed, with some studies even reporting that individuals with BPD were physiologically *less* responsive to emotional stimuli, compared to participants with avoidant personality disorder (Herpertz, et al., 2000; Herpertz, Kunert, Schwenger, & Sass, 1999).

There may, however, be a few key reasons as to why these studies did not find evidence of greater emotional reactivity among BPD participants. First, these investigations did not control for dissociation during the procedures. This may be important, as dissociation has been associated with blunted physiological responses

(Ebner-Priemer et al., 2005). Second, these studies examined emotional reactions to stimuli such as pleasant, neutral, and disturbing photographs (e.g., severed arms) that were not personally relevant to persons with BPD. In contrast, in a study which used affective stimuli related to fear of abandonment, a characteristic fear among people with BPD, participants who engaged in impulsive self-harm behaviour (most of whom met criteria for BPD) reported significantly stronger emotions compared to individuals with other types of personality disorders (Herpertz, Gretzer, Steinmeyer, Muehlbauer, Shurkens, & Sass, 1997). A more recent study (Zeigler-Hill & Abraham, 2006) found that undergraduates with BPD features had stronger negative emotional reactions to stressful interpersonal events, compared with healthy controls.

The Importance of Interpersonal Stressors

One potential explanation for these discrepant findings is that persons with BPD only show heightened emotional reactivity to certain types of events or stimuli. Specifically, I hypothesize that emotional reactivity may be most likely to occur within *interpersonal* contexts. Findings from a recent study indicated that persons with BPD are more sensitive than controls to interpersonal emotional stimuli, as indicated by quicker and more accurate identification of facial emotional expressions (Lynch, Rosenthal, Kosson, Cheavens, Lejuez, & Blair, 2006). Instability in interpersonal relationships and fears of abandonment are also core characteristics of BPD (APA, 2000; Morey, Gunderson, & Quigley, 2002; Skodol et al., 2002). Furthermore, there is evidence that BPD symptoms may even be influenced by interpersonal stressors. For example, real or

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imagined relationship stressors often precipitate BPD symptoms or maladaptive behaviours (Agrawal, Gunderson, & Holmes, 2004; Levy, 2005), and the alleviation of acutely stressful interpersonal situations (e.g., divorce) has been associated with the reduction of BPD symptoms (Gunderson, Bender, & Sanislow, 2003). Moreover, persons with BPD have deficits in the ability to solve interpersonal problems, compared with non-BPD controls (Berk, Jeglic, Brown, Henriques, & Beck, 2007; Ziegler-Hill & Abraham, 2006).

There is also some evidence that the environmental triggers that precipitate suicidal behaviour, and the reasons given for attempting suicide, may be different among persons with BPD than among other patient populations (Gunderson & Ridolfi, 2001; Kelly, Soloff, Lynch, Haas, & Mann, 2000). One study found that precipitating events for suicide attempts were more likely to be interpersonal in nature among persons with BPD and major depressive disorder (MDD) than among those with MDD alone (Brodsky, Groves, Oquendo, Mann, & Stanley, 2006). Furthermore, refuting the notion that interpersonally-related attempts are merely manipulative suicide "gestures" and therefore not serious attempts, this study demonstrated that suicide attempts triggered by interpersonal stressors were as lethal as attempts triggered by non-interpersonal events.

Limitations of the Extant Research

Despite the clear importance of interpersonal difficulties in BPD, a dearth of research has examined the emotional reactions of persons with BPD to stressful interpersonal situations. Even when research has examined

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interpersonal stressors, there has been no attempt to differentiate between different kinds of interpersonal situations, such as interpreting facial expressions versus the ending of a romantic relationship. Furthermore, what is clearly missing in the literature is an attempt to study emotional reactivity to events that approximate the interpersonal situations with which persons with BPD struggle in their daily lives, such as being rejected by someone.

Another important limitation is that existing studies in this area have relied largely on retrospective self-report methods and have not controlled for the magnitude of the emotional stressor. For example, in one recent study, undergraduate subjects with BPD features reported more negative interpersonal events, perceived these interpersonal events as having more importance, and also reported stronger negative reactions (i.e., more negative change in affect) to daily interpersonal stressors than did undergraduate controls (Zeigler-Hill & Abraham, 2006). Given that this study used retrospective self-report measures, however, these findings may be biased due to recall limitations. Furthermore, by having participants report on naturally occurring negative events, this study did not control for the number or severity of stressors. It is possible, therefore, that people with BPD simply experienced more frequent or severe stressful events and therefore experienced greater change in affect primarily due to the quality of the stressor.

To fully ascertain whether people with BPD are more emotionally reactive than controls in response to negative events, all participants should experience the same stressful event. A well-controlled laboratory-induced stressor would be

an illuminating extension of this research. Virtually no research to date has examined emotional reactivity to stressful events with a well-controlled, ecologically valid, laboratory stressor that simulates real-life experiences for people with BPD.

Primary Objectives and Hypotheses

Objective 1: Develop Ecologically Valid Laboratory Interpersonal Stressors

Perhaps one reason for the dearth of research on emotional reactivity to laboratory stressors, particularly interpersonal stressors, is that the field currently lacks an ecologically valid method to examine emotional stress that occurs in the daily lives of people with BPD. A wide variety of emotion induction procedures (e.g., music, film, imagery, autobiographical recall) have been shown to be effective at inducing both global and specific emotions (for reviews, see Gerrards-Hesse & Spies, 1994; Martin, 1990; Westermann, Spies, Stahl, & Hesse, 1996). These procedures, however, often aim to re-create past emotional experiences, rather than generate a current situation that naturally elicits the desired emotions. Furthermore, only a minority of these procedures use stimuli that are interpersonally relevant (e.g., Brewer, Doughtie, & Lubin, 1980). The few existing studies have relied on tightly controlled experimental stimuli (e.g., minute changes in facial expressions or photographs of disturbing scenes) that do not appear to adequately represent the real world interpersonal situations in which persons with BPD experience emotional problems (Lynch et al., 2006). Additionally, previous research has not adequately captured one of the key triggers of emotional distress among people with BPD – being rejected or

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abandoned by another person. For these aforementioned reasons, there is a need to develop a standardized laboratory method that induces negative emotional states by simulating real life interpersonal events with which persons with BPD commonly struggle.

Examples of interpersonal emotion induction procedures include social performance tasks such as public speaking speech tasks (e.g., van Eck, Nicolson, & Berkhof, 1996; Zautra, Reich, & Davis, Potter, & Nicolson, 2000) and the Trier Social Stress Task (TSST; Kirschbaum, Pirke, & Hellhammer, 1993). A meta-analytic review of 208 laboratory stress studies, (Dickerson & Kemeny, 2004) found that paradigms characterized by social-evaluative threat, such as stressful situations with an evaluative audience present or where participants were the target of negative social comparison, led to greater cortisol reactivity (which has been linked to the experience of shame) compared to paradigms without social-evaluative threat. Furthermore, procedures that involve failure experiences are among the most successful means of inducing emotions in the laboratory, especially those in which participants receive false feedback on social skills or personality (Nummenmaa & Niemi, 2004; Westermann, Spies, Stahl, & Hesse, 1996). These types of procedures provide an appealing alternative to the more traditional achievement-oriented laboratory stressors. Additionally, Leary and colleagues (Leary, Haput, Stausser, & Chokel, 1998; Leary, Tambor, Terdal, & Downs, 1995) have demonstrated that imagined or actual social rejection lead to lowered self-esteem and increased negative emotions (e.g., anxious, upset, ashamed). In the Yale Interpersonal Stressor (YIPS; Stroud, Tanofsky-Kraff,

Wilfey, & Salovey, 2000), participants are made to feel excluded and isolated by interacting with two same-sex confederates. Alternatively, social rejection situations have been created using computer "social skills" games in which subjects receive scores indicating their popularity is below average (Berry & Broadbent, 1984). Similarly, a more recent virtual ball-tossing game called "cyberball" has been created for the purpose of studying ostracism and social exclusion (Williams, Cheung, & Choi, 2000).

According to the evidence described above, the strongest, most effective, and longest lasting emotion inductions involve negative feedback about, or rejection of, the self by others. For example, previous research has found negative feedback on a test of social skills and personality results in a strong and enduring mood state that shows only a moderate decline even after 25 minutes of unrelated activity (e.g., Forgas & Hepperlin, 1982). Furthermore, failure situations are often a part of people's lives in the real world (particularly, undergraduate students, who are the focus of my research). Therefore these paradigms offer strong ecological validity. Finally, performance based tasks also help disguise the intent of the emotion induction, which may be important to maximize effect (Parrott & Hertel, 1999).

In order to most effectively investigate emotional reactivity to interpersonal stressors among persons with BPD features, I chose to utilize one false-feedback emotion-induction paradigm where participants experience academic failure by receiving *negative feedback* on an essay writing task, and one false-feedback emotion-induction paradigm where participants experience *rejection* from another

participant on the basis of written responses to personal questions. The design of these procedures aims to maximize emotional effect and ecological validity by having participants experience negative personally-relevant feedback from real people (not computer persons), without the use of labour-intensive strategies requiring multiple confederates. For Objective 1, I examined the feasibility and believability of these procedures. My hypotheses were as follows:

- **Hypothesis 1A**: Both procedures are feasible to conduct in a laboratory setting and believable (as indicated by 50% of participants reporting belief in the feedback on a self-report believability scale) among undergraduate participants.

- **Hypothesis 1B**: Participants' self-reported belief of the false feedback will not be systematically related to the strength of reported negative emotional states following the emotion inductions.

I chose the benchmark of 50% believability as acceptable for this study for several reasons. First, as this is the first investigation of these procedures, I was uncertain of what level of believability to expect. Second, almost no previous research using false feedback emotion induction procedures have directly assessed and reported believability, so I had no published standard to which to aim for in this study. However, no published study that I am aware of has reported belief in the false feedback as a problem for the effectiveness of the emotion induction. Finally, it is possible that asking direct questions about belief may arouse suspiciousness in participants. This may lead people to report they did not believe the procedures, when they actually did believe up until when they

were asked. Given this possibility, I chose to utilize a conservative benchmark for acceptable reports of believability.

Objective 2: Examine Emotional Reactivity to Interpersonal Stressors Among Persons with BPD Features

Objective 2 aims to examine the emotional reactivity of persons with BPD features to the real-world interpersonal problems with which persons with BPD struggle – social rejection and failure. In addition to examining global reactivity across negative emotions, I also examined the specific types of emotional reactions of persons with heightened BPD features to these interpersonal stressors, including emotions such as anger, shame, guilt, anxiety, and general distress. As there has been little research on the specific emotional reactivity to interpersonal stressors in BPD, my hypotheses regarding specific emotions are somewhat exploratory. Nonetheless, I anticipated greater emotional reactivity in terms of general negative emotions, as well as anger and shame, specifically. My hypotheses were as follows:

- **Hypothesis 2A**: High-BPD participants will report greater levels of state negative emotions at baseline and after both emotion inductions, compared with low-BPD participants.

- **Hypothesis 2B**: High-BPD participants will show greater emotional reactivity to both stressors compared with low-BPD participants, as shown by greater increases in negative emotional states from baseline to post-emotion induction.

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- **Hypothesis 2C**: High-BPD participants will report greater levels of shame and anger at baseline and after both emotion inductions, compared with low-BPD participants.

- **Hypothesis 2D**: High-BPD participants will show greater anger and shame reactivity to both stressors compared with low-BPD participants, as shown by greater increases in anger and shame from baseline to post-emotion induction.

Method

Participants

The majority of research on BPD has focused on clinical samples and may not generalize to the wider spectrum of individuals with BPD characteristics. Given Trull's (1995) work indicating that BPD features may be best conceptualized as dimensional (rather than categorical) it is important to also study non-clinical populations who exhibit high borderline personality features. Utilizing undergraduate samples also had advantages for the current study, such as feasible recruitment. Furthermore, undergraduate psychology students may be savvier, providing a more stringent test of the believability of these false-feedback procedures.

In the present study I recruited a sample of university undergraduates (n=76) who were divided into 2 groups according to pre-screening criteria. The high BPD group (n=31) is comprised of participants possessing high levels of borderline personality features, as assessed by the Borderline Features Scale of the

Personality Assessment Inventory (PAI-BOR; Morey, 1991). Consistent with previous research, a score of 38 on this scale served as the threshold for high BPD features. The "healthy control group," is comprised of people (n=45) who scored below the established mean on the PAI-BOR for undergraduates (i.e., below a score of 23). Participants (70% of whom were female) ranged in age from 17 – 54 years old, with an average age of 22.1 years. Participants (see Table 1) identified with a wide range of racial and ethnic backgrounds, but the sample was predominantly White/Caucasian (39%) and Chinese/Chinese Canadian (33%).

Table 1: Demographics

	n	%
Race/ethnicity		
White/Caucasian	30	39.5
Chinese/Chinese Canadian	25	32.9
Other Asian/Asian Canadian	7	9.2
Middle Eastern/Arab	2	2.6
Korean or Korean Canadian	2	2.6
East Indian/Indo-Canadian	2	2.6
Black/African Canadian	1	1.3
Other	3	3.9
More than one racial group	1	1.3
Chose not to answer	3	3.9
Gender		
Female	53	70
Male	23	30

General Procedures

Participants were recruited from the undergraduate participant pool at Simon Fraser University, as well as through flyers and advertisements posted around the university campus. During a mass testing procedure or group questionnaire session at the beginning of the term, individuals completed the pre-screening measures to form the aforementioned groups, and were then invited to participate in the laboratory session. Once participants had been scheduled for a laboratory session, they were randomly assigned to one of two conditions: academic failure or social

rejection. After participating in the laboratory session, participants were fully debriefed, closely monitored for signs of distress, and compensated for their participation (see Table 2). Participants either earned course credit or were paid $5 in exchange for their participation in each phase of this research, according to their preferences.

Table 2: Procedures

Order	Task	Measures
1	Self-Report	PAI[a], BSI[b] (group session)
3	Emotional Baseline	PANAS[c], DSS[d]
4	Vanilla Baseline	none
5	Current Emotion State 1	PANAS, DSS
6	Writing Task	Essay or Personal Profile
7	Writing Task	Evaluate Other's Writing
7	Current Emotion State 2	PANAS, DSS
10	Emotion Induction	Receive Feedback
11	Current Emotion State 3	PANAS, DSS
12	Self-Report	Believability Questions

[a] Personality Assessment Inventory – Borderline Scale (Morey, 1991)

[b] Brief Symptom Inventory (Derogatis et al., 1993)

[c] Positive And Negative Affect Schedule (Watson et al., 1988)

[d] Dissociative State Scale (Stiglmayr et al., 2001)

Measures

Borderline personality features. The Borderline scale of the Personality Assessment Inventory (PAI-BOR; Morey, 1991) was used to assess borderline personality features for group classification. The PAI-BOR is a 24-item measure, with items scored on a 4-point scale ranging from 0 = completely false, to 3 = very true, that assesses characteristics and symptoms central to the DSM

description of BPD such as instability of affect, relationships, and identity, as well as engagement in self-harm behaviours. The PAI-BOR has good internal consistency (α=.84) and test-retest reliability (r=.86). Furthermore, the PAI-BOR correlates well with the MMPI borderline personality disorder scale in both clinical (r=.77) and community (r=.63) samples (Morey, 1991). When used with a similar undergraduate population in a recent study, the PAI-BOR demonstrated high internal consistency (α=.92) and test-retest reliability (r=.89) over a one month time period (Chapman et al., 2008). In the current investigation, the PAI-BOR again demonstrated adequate internal consistency (α=.84).

Overall psychopathology. The Brief Symptom Inventory (BSI; Derogatis, 1993) is a 53-item self-report measure of psychological symptoms and complaints. This measure yields scores on 9 symptom dimensions, and three global indices of psychopathology. The Global Severity Index (GSI) can serve as a covariate to control for overall level of psychopathology. The BSI has demonstrated adequate psychometric properties (α=.71-83, r=.68-91) in previous studies (Derogatis, 1993) and high internal consistency (α=.97) in this sample.

State Measures of Emotional Responses to Laboratory Procedures

Affective state. The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) measured participants' subjective affect during the laboratory procedure. The PANAS consists of 10 negative and 10 positive affective adjectives. Items are scored on a 5-point Likert scale, with higher scores indicating greater experiencing of that affective state at the current time. The PANAS has shown both strong reliability and validity (MacKinnon, Jorm, Christensen, Korten,

Jacomb, & Rodgers, 1999; Watson et al., 1988). For the purposes of this study, PANAS items "irritable" and "hostile" were combined to form a composite *anger* variable. The same approach was taken to form an *anxiety* composite variable from the items "nervous" and "jittery."

Dissociation. The Dissociative State Scale (DSS; Stiglmayr, Shapiro, Stieglitz, Limberger, & Bohus, 2001) was used to assess current Dissociative symptoms during the laboratory procedures. A significant number of individuals with BPD features dissociate in stressful situations (Simeon, Knutelska, Smith, Baker, & Hollander, 2007; Zanarini, Ruser, Frankenburg, & Hennen, 2000), and dissociation has been associated with dampened autonomic reactivity (Ebner-Priemer et al., 2005; Griffin, Resick, & Mechanic, 1997; Lanius, et al., 2002; Sierra & Berrios, 1998; Sierra, et al., 2002). Therefore, measures of emotional responding could be severely impacted, and group differences obscured, if high-BPD participants dissociate during the laboratory procedures. Thus, it is imperative to control for that possibility.

Believability. The degree to which participants believe the false feedback procedures will be evaluated through two follow-up questions that ask whether participants believe the feedback is real, and whether they believe the feedback came from another participant.

Laboratory Procedures

Participants were tested individually in the laboratory session, but each participant was told he or she would be interacting with someone else of the same sex. Participants were also told they would engage in some brief writing tasks. They would then swap their writing with another participant, and asked to respond to each

other's work. They were also told they may be given the opportunity to meet this other person at the end of the study. After consenting to participate, all participants completed true baseline measures of their current affective state. Next, all participants engaged in a neutral computer task (vanilla baseline) which has been designed to induce baseline mood. For this task, they are simply required to count the number of times a colour of their choice appears on the screen. After 5 minutes, participants again completed measures of their current affective state. Following these baseline affective measurements, participants underwent the emotion induction procedure to which they had been randomly assigned.

Academic feedback condition. Participants were asked to write a one-paragraph essay on abortion, either pro-choice or pro-life. Participants were free to choose whichever option they prefer. After completion, participants were told that their essay will be given to the other participant (who was actually non-existent). Participants were then given a hand-written essay, presented as being written by the other participant, which paralleled the argument they wrote in their essay (either pro-life, or pro-choice). There was one standardized essay of each type, written in either characteristic "girl's" handwriting, or "boy's" handwriting, which was matched to the sex of the participant. Participants evaluated this essay by assigning scores from 0-10 on various dimensions, such as originality or clarity of writing. There was also room at the bottom for participants to write any additional comments or feedback about the essay. The essay that participants were given to read had been written well; such that it was likely participants will rate the essay positively. A few minutes later, the experimenter collected the participant's feedback to give to the fictitious

participant and then returned with feedback on the essay the actual participant wrote, ostensibly from the other participant. In reality, this feedback constituted the standardized academic failure emotion induction. All participants received the same negative review, scoring 2 or 3 out of 10 for each set of criteria. Furthermore, a handwritten comment indicated that, "This was one of the worst essays I have ever read!" This academic feedback condition is modelled after similar procedures that have been used to successfully induce negative emotional state in a number of previous studies (e.g., Bushman & Baumeister, 1998; Twenge, Baumeister, Tice, & Stucke, 2001).

Social rejection condition. Instead of writing an essay about abortion, participants in this condition were asked to answer questions about themselves. Examples of these questions include their favourite books and movies, items they would take to a deserted island, and 5 words that best describe themselves. These questions resemble those that often appear on people's online profiles on popular social network sites such as Facebook® and Myspace®. Therefore, participants are likely to have some experience getting to know people in this style. Again, participants' completed responses were collected and given to the fictitious other participant. Participants also received a standardized completed profile of someone of the same sex as the participant. In a previous study, these profiles were the rated the most desirable out of 20 male and 20 female profiles, therefore most participants will likely rate these profiles positively. After reading the standardized profile, participants were asked to answer questions about their impressions of the other person. These questions include whether or not they

would want to be friends with this person, if they seem fun, unique, or interesting, and if they would like the opportunity to meet this person at the end of the study. After completion, the experimenter collected this evaluation to give to the fictitious participant, and returned with a standardized evaluation form that constituted the social rejection emotion induction. All participants received the same negative feedback indicating that the other participant does not want to be friends with them, does not think they are very interesting, and that they have no desire to "waste their time" by meeting them at the end of the experiment.

Upon receiving the negative feedback in both conditions, participants were again asked to complete measures of their current affective state. Following these affective measures, participants were asked several follow-up questions regarding the way the feedback made them feel and whether or not they believed it was coming from another participant. In an effort to reduce the likelihood of missing data, research assistants were trained to check measures for any missing responses during the procedures and gently ask participants to complete the missing item(s). Participants were then verbally probed for suspicion, fully debriefed, and compensated for their participation.

Clinical management procedures. All participants were closely monitored for signs of distress during the experiment. Research assistants were carefully trained to stop the procedure if any participant became seriously disturbed. Every effort was made to undo any negative effects of the emotion induction procedures, such that participants left in the same or more positive mood than when they came into the study. Should any participant have remained distressed as a result

of the study, the experimenter would follow a protocol designed to help participants manage their distress. If needed, participants were also provided with a list of resources, such as crisis lines and counselling agencies, should they desire any ongoing support after leaving the laboratory. Safeguards were also in place such that a registered clinical psychologist (the supervisor of this research) was willing to talk to any participant experiencing distress as a result of their participation and feeling as though they need additional support. This was never required in the course of this study.

Results

Preliminary Analyses

Power and sample size considerations. According to Cohen's (1992) recommendations, 18 participants per group (n=72 overall) are required to detect differences of a large effect size in an ANOVA with 4 groups (Low-BPD Rejection, Low-BPD Failure, High-BPD Rejection, High-BPD Failure) using $\alpha = .05$ and power =.80. This study used a 2x2 factorial design and a within-subjects repeated measure to further increase power. According to a meta-analysis on the use of failure manipulations as emotion inductions (Nummenmaa & Niemi, 2004), effect sizes for affective reactions were moderate ($r > .24$). Additionally, when the failure experience was related to social skills (as compared with intelligence or physical ability), the effect was much larger ($r>.60$). Furthermore, the size of the effects found in this study was well beyond the threshold for a large effect ($ds<2.90$). Therefore, the overall sample size of n =76 appears to have been adequate.

Missing data. For measures of current emotional state, there were only 2 missing data points on the PANAS and only 9 missing data points on the DSS. Additionally, there were 4 missing data points on the items measuring belief of the false feedback procedures. Cases with missing data were excluded pairwise for each analysis. Because the BSI and the DSS were not added to the laboratory questionnaire battery until we had run our first 17 pilot participants, analyses with these measures were conducted with the remaining 59 participants.

Descriptive statistics and data transformations. Descriptive statistics, including measures of central tendency and normality of the distribution, were examined for all emotional state variables (see Table 3). Many of the variables demonstrate significant skewness (range = .23 – 3.65) and/or kurtosis (range = -.60 – 14.66) at each specific time point. Following logarithmic transformations, however, the distribution properties were not substantially different; thus, I used raw scores for all analyses. The scores indicating differences in emotions from pre- to post-emotion inductions (see Table 4) had acceptable distribution properties (*skew* range = -1.89 – 3.02, *kurtosis* range = .05 – 8.99). Extreme outliers, if determined to be influential, were moved to three standard deviations from the mean.

Table 3: Descriptive Statistics of Reported Emotions on the PANAS

	Range	Mean (SD)	Range	Mean (SD)
Pre-Emotion Induction				
	High-BPD		**Low-BPD**	
Negative Affect	1.00-4.30	1.73 (.86)	1.00-3.30	1.26 (.48)
Shame	1.00-4.00	1.55 (.93)	1.00-4.00	1.18 (.61)
*Anger**	-.53-3.58	.36 (.21)	-.53-2.55	-.23 (.09)
Guilt	1.00-4.00	1.52 (.96)	1.00-4.00	1.18 (.58)
Distress	1.00-4.00	1.52 (.96)	1.00-5.00	1.36 (.77)
*Anxiety**	-.65-3.04	.39 (.18)	-.65-2.07	-.28 (.09)
	Range	Mean (SD)	Range	Mean (SD)
Post-Emotion Induction				
	High-BPD		**Low-BPD**	
Negative Affect	1.00-3.10	1.94 (.61)	1.00-3.00	1.46 (.53)
Shame	1.00-5.00	1.84 (1.12)	1.00-4.00	1.40 (.81)
*Anger**	-.76-2.80	.54 (.18)	-.76-1.48	-.37 (.09)
Guilt	1.00-3.00	1.29 (.59)	1.00-2.00	1.11 (.32)
Distress	1.00-5.00	2.35 (1.25)	1.00-5.00	1.73 (.96)
*Anxiety**	-.75-2.57	.27 (.16)	-.75-2.57	-.20 (.11)

* composite variables

Table 4: Descriptive Statistics of the Reported Shift in Emotions from Pre- to Post-Emotion Induction

	Range	Mean (SD)	Range	Mean (SD)
	High-BPD		**Low-BPD**	
Negative Affect	-2.10-1.70	.21 (.72)	-1.40-1.90	.20 (.53)
Shame	-3.00-3.00	.29 (1.24)	-2.00-3.00	.22 (.95)
*Anger**	-2.56-2.47	.18 (.18)	-2.29-1.58	-.13 (.10)
Guilt	-3.00-1.00	-.23 (.84)	-2.00-1.00	-.07 (.54)
Distress	-3.00-4.00	.45 (1.29)	-2.00-2.00	.38 (.86)
*Anxiety**	-2.14-1.10	-.11 (.14)	-1.77-2.64	.08 (.12)
Dissociation	-71.00-62.00	-13.68 (28.54)	-29.00-19.00	-3.84 (9.13)

* composite variables

Potential covariates. It is important that any findings can be attributed to BPD features uniquely, rather than characteristics of psychopathology more generally. Therefore, I examined group differences between high and low-BPD participants in severity of psychopathology, as measured by the Global Severity Index score from the Brief Symptom Inventory. Although high-BPD participants reported significantly more psychopathology than low-BPD participants, $t(53) = -5.57$, $p = .000$, GSI scores were not significantly correlated with the shift in emotional state following the emotion induction procedures, $r=.12$ $p=.40$. Therefore, GSI scores were not included as covariates in any subsequent analyses.

A significant proportion of individuals with BPD features engage in dissociation when faced with stress (APA, 2000; Simeon et al., 2007), therefore it is important to determine whether dissociation impacted the assessment of emotional state during the laboratory procedures. As expected, high-BPD participants reported greater dissociative symptoms following the emotion induction procedures than low-BPD participants, $t(57) = 1.95$, $p=.056$. Therefore, I conducted subsequent analyses examining the effect of BPD group and emotion induction condition on differences in emotions between pre- and post-induction both with and without dissociation scores as a covariate.

Believability of Emotion Induction Procedures (Objective 1)

In terms of the believability of the false feedback procedures, 54% of participants ($n=40$) indicated they believed the feedback was real, while 46% of participants ($n=34$) indicated they believed the feedback came from another participant. Furthermore, as expected (hypothesis 1B), believability scores were not significantly correlated with the shift in emotional state following the emotion inductions, $rs=.02-.30$, $ps =.06-.89$, except for shame. Belief was correlated with shame ($r = -.30$, $p = .01$) such that the less participants believed the feedback was real, the less they reported an increase in shame following the emotion inductions. The second belief question was not correlated with the shift in any of the emotion variables (see Table 5). In addition, believability was not significantly different between high ($n=30$) and low-BPD ($n=44$) participants, $t(72) <.37$, $p >.57$. Together, these findings indicate that any group differences in emotional shifts are not due to differences in believability. Findings did, however, indicate

that believability scores were greater for the academic failure condition (M = 1.56, SD = .50) compared with the social rejection condition (M = 1.33, SD = .48), $t(72)$ = -1.98, p = .05.

Table 5: Correlation of Believability with Emotional Shift Variables

	$r (p)$	$r (p)$
	Belief Question 1	**Belief Question 2**
Negative Affect	-.22 (.06)	-.04 (.75)
Shame	-.30 (.01)*	-.11 (.36)
Anger	-.19 (.11)	-.12 (.33)
Guilt	-.02 (.90)	.06 (.64)
Distress	-.07 (.54)	.04 (.86)
Anxiety	-.03 (.80)	-.03 (.83)

* correlation is significant at α=.05 level

Emotional Reactivity to Interpersonal Stressors (Objective 2)

Global negative emotions. In order to examine emotional reactivity to the emotion induction procedures, I conducted a series of mixed-model ANOVAs using self-report measures of current emotional state (aggregate negative PANAS scores) as the DV, and Group (high- versus low-BPD), Time (pre- versus post- emotion induction), and Condition (academic failure versus social rejection) as the IVs. Consistent with my hypothesis (2A), I found a significant effect of Group, $F(1, 72)$ = 13.57, p <.01, η^2=.16. Planned comparisons revealed the High-BPD group (M=1.82, SE = .10) reported a significantly more negative emotional state overall than the Low-BPD group (M=1.36, SE=.08).

Figure 1: Overall Levels of Negative Emotions
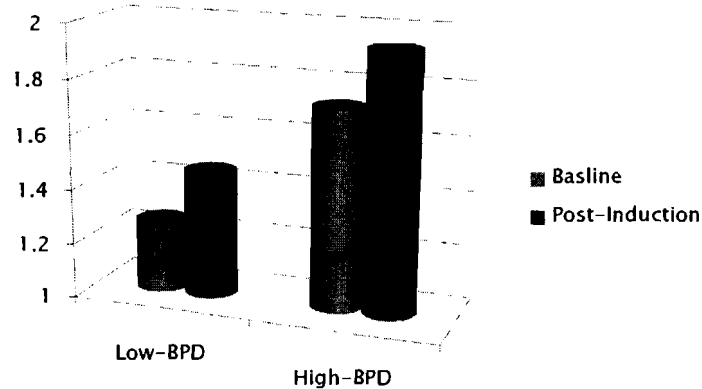
I also hypothesized that the high-BPD participants would show a greater difference between pre- and post-stressor emotion scores, compared with low-BPD participants (Hypothesis 2B). In the analysis above, there was a non-significant Group x Time interaction, $F(1,72) = .15$, $p = .70$, $\eta^2 = .002$. To further examine group differences in the shift in negative emotions from pre- to post-emotion inductions, I subtracted pre-induction levels of negative emotions from post-induction levels of negative emotions to calculate a difference score for each participant. Group differences between high- and low-BPD participants were not significant, $t(74) = -.07$, $p = .94$, indicating that high-BPD participants did not report a greater negative change in negative emotions following the emotion induction procedures than did the low-BPD participants. After including dissociation as a covariate, however, the effect of BPD group was significant $F(1, 58) = 4.11$, $p = .047$, $\eta^2 = .07$ with high-BPD participants ($M = .43$, $SE = .11$) reporting a significantly greater increase in overall negative emotions than low-BPD participants ($M = .14$, $SE = .09$).

Figure 2: Shift in Negative Emotions from Pre- to Post-Emotion Induction (Controlling for Dissociation)
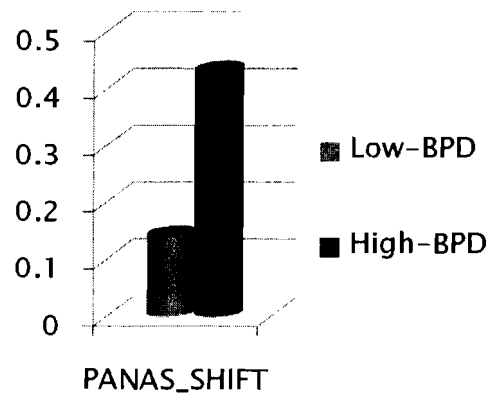
Although gender was not significantly associated with measures of emotional shift (rs = -.03 - .13, ps = .23-.77), it is possible that gender may impact the pattern of these results. Due to the small number of male participants in this study (n=23), it was not possible to fully examine gender as a moderator. However, I conducted the primary analyses exclusively on female participants (n=53) and the overall pattern of results was the same as those reported for the full sample.

Emotion specific analyses. In order to examine the specificity of emotional reactivity among persons with BPD, I conducted a series of mixed-model ANOVAs (as described above) separately with specific emotions as the DVs. As described earlier (Hypotheses 2C and 2D), I expected to find greater shame and anger, as well as shame and anger reactivity, among high-BPD participants, compared to low-BPD participants.

The main effect of Group on shame was significant, $F(1, 72) = 5.08$, $p=.02$, $\eta^2=.07$, such that high-BPD participants ($M=1.66$, $SE = .12$) reported significantly more shame than did low-BPD participants ($M=1.29$, $SE=.10$).

Figure 3: Levels of Shame
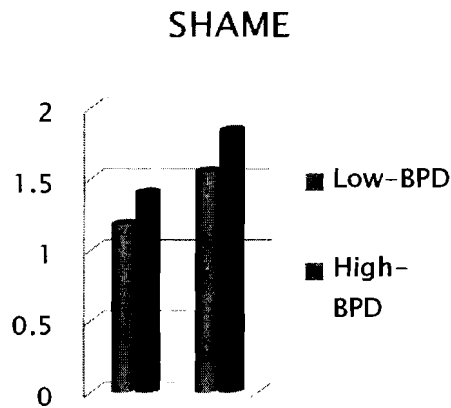
SHAME

There were no significant group differences on the shift in shame from pre-to post-induction, $t(72)= -.27$, $p = .79$. After controlling for dissociation, however, high-BPD participants ($M=.66$, $SE=.19$) reported a significantly greater increase in shame following the emotion induction procedures than did low-BPD participants ($M=.01$, $SE=.14$), $F(1, 54) = 7.32$, $p = .01$, $\eta^2=.12$.

Figure 4: Shift in Shame from Pre- to Post-Emotion Induction

SHAME_SHIFT
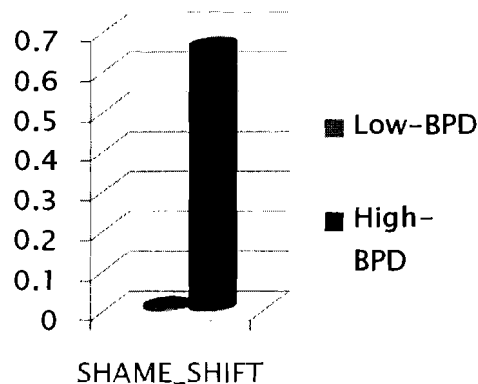
In order to examine anger reactivity, I computed a composite variable by summing the z scores and dividing by 2 for the "hostile" and "irritable" items on the PANAS, which were highly correlated both pre-emotion induction ($r=.76$, $p=.000$) and post-emotion induction ($r=.59$, $p=.000$). The main effect of Group was significant, $F(1, 72) = 18.07$, $p=.000$, $\eta^2=.20$, such that high-BPD participants ($M=.43$, $SE=.14$) reported significantly more anger than low-BPD participants ($M=-.31$, $SE=.11$).

Figure 5: Levels of Anger
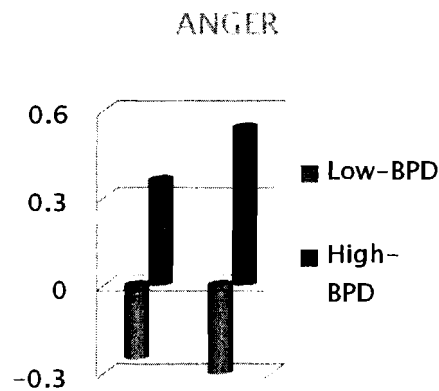
Group differences on changes in anger, however, were not significant, $t(74) = -1.59$, $p = .12$. Thus, contrary to expectations, high-BPD participants did not report a significantly greater increase in anger following the emotion inductions than the low-BPD participants. This difference remained non-significant after controlling for dissociation, $F(1, 56) = 2.13$, $p = .15$, $\eta^2=.04$.

Figure 6: Shift in Anger from Pre- to Post-Emotion Induction
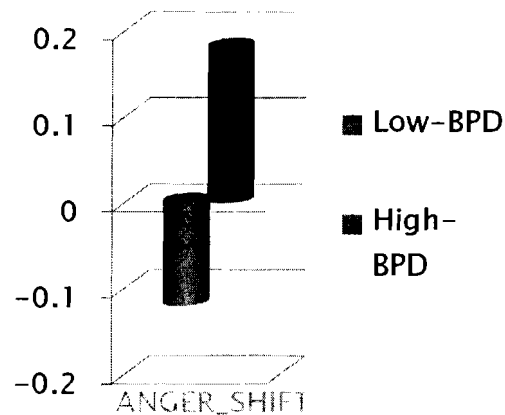
The Time x Condition interaction was not significant, $F(1, 72) = 2.80$, $p = .10$, $\eta^2=.04$, indicating that one condition did not result in more anger for all participants. However, there was a three-way interaction of BPD Group x Time x Condition, $F(1, 72) = 3.75$, $p=.05$, $\eta^2=.05$. Bonferroni-adjusted post-hoc comparisons revealed that among high-BPD participants, the social rejection condition resulted in a significant increase (*Mean difference*=.63, *SE*=.22, *p*=.01) in anger from pre-to post-induction, whereas there was no significant increase in anger among high-BPD participants in the academic failure condition (*Mean difference*= -.10, *SE*=.19, *p* = .58). Furthermore, among high-BPD participants, the social rejection condition (*M*= .57, *SE* = .21) resulted in a greater increase in anger than the academic failure condition (*M*= -.10, *SE* = .25), *t*(29) = 1.97, *p* = .058). Among the low-BPD participants, neither condition resulted in a significant increase (*Mean differences* = -.42;-.32, *SE*s= .19, *p*s=.39; .55) in anger from pre-to post-induction.

Figure 7: Condition Effects on Shift in Anger
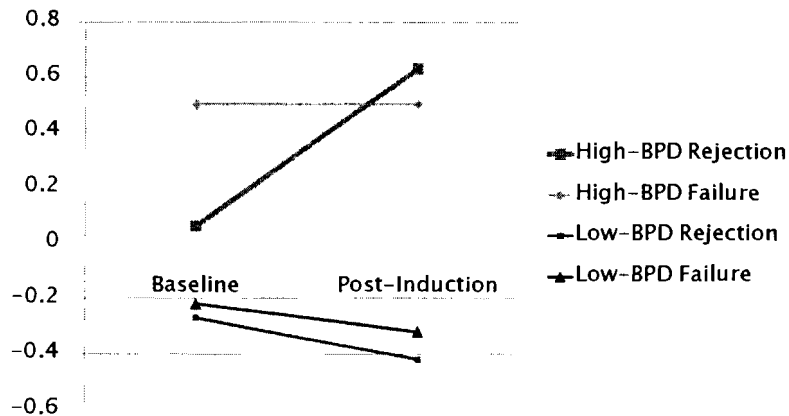
As negative emotions are sometimes highly correlated, it was possible that any group differences in shame were driven by anger, or vice versa, if there were high correlations between these two emotional states. The correlation between shame and anger, however, was small and non-significant, $r = .20$, $p = .08$. Therefore, I did not proceed to control for shame in anger analyses, or vice versa.

Providing further evidence of the importance of examining differential patterns of results among specific emotions, high-BPD participants did not evidence greater guilt [$t(74)=1.0$, $p=.33$], anxiety [$t(74)=1.07$, $p=.29$], or distress [$t(74) = -.30$, $p=.77$] reactivity, nor did they do so after controlling for dissociation.

Secondary analyses. Although I had no *a priori* hypotheses concerning differential effects of the two emotion induction conditions, I conducted an exploratory examination of differential effects of each type of stressor – failure vs. social rejection - on global emotional reactivity among persons with BPD features. With the Group x Time x Condition mixed-model ANOVA reported above, I examined effects involving the Condition variable. The Condition x Time interaction was not significant, $F(1, 72) =1.43$, $p = .24$, $\eta^2=.02$, indicating that no

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one condition resulted in a greater increase in negative emotions for all

participants. The Group x Condition x Time interaction, however, was significant,

$F(1, 72) = 5.99$, $p = .02$, $\eta^2 = .08$. Bonferroni-corrected post-hoc comparisons

revealed that the academic failure condition resulted in a significant increase in

overall negative emotions from pre- to post-induction among low-BPD

participants (*Mean difference* = .29, *SE*=.13, $p = .03$), while the social rejection

condition did not (*Mean difference* = .11, *SE* = .13, $p = .40$). Among high-BPD

participants, the pattern was opposite, where the social rejection condition

resulted in a significant increase in negative emotions (*Mean difference* = .51,

SE= .17, $p = .003$) and the academic failure condition did not (*Mean difference* =

-.01, *SE* = .14, $p = .97$). Furthermore, among high-BPD participants the social

rejection condition (*M*=.51, *SE* =.16) resulted in a significantly greater increase in

negative emotions, $t(72) = 2.05$, $p = .05$, than did the academic failure condition

(*M*=-0.01, *SE*= .18).

Figure 8: Condition Effects on Negative Emotions

35
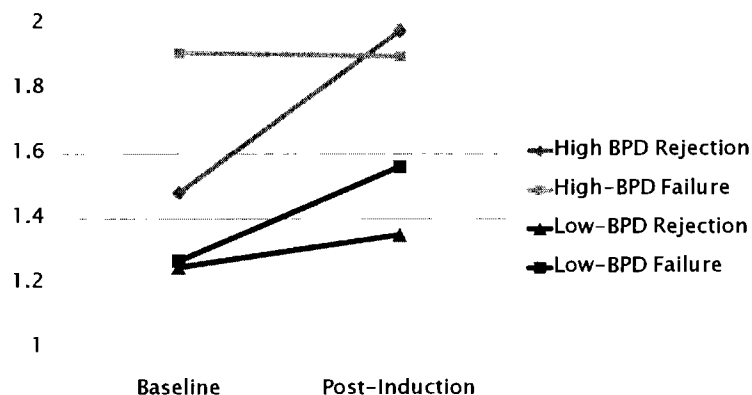
Discussion

Heightened emotionality and difficulties with emotion regulation are often considered central to many of the severe behavioural difficulties of persons with BPD (e.g., Linehan, 1993). The research on heightened emotional reactivity in BPD, however, has suggested that persons with BPD features may not experience heightened global reactivity. Rather, emotional reactivity may only occur in certain contexts, such as interpersonal contexts. Therefore, the objectives of this study were to 1) develop and test a new emotion induction procedure utilizing an interpersonal stressor - social rejection, and 2) examine emotional reactivity of persons high and low in BPD features to two well-controlled, laboratory emotion induction procedures.

Most research in the area suffers from two main limitations that were addressed by this study, such as the use of retrospective self-reports, and the examination of naturally occurring, uncontrolled stressors. Having participants actually experience negative emotions live in the laboratory, rather than report on memories of past emotions, is a definite strength of this investigation. Furthermore, questionnaire research that asks participants about negative events they have experienced in the past does not control for the number or severity of stressors. This study takes the research in this area a step further by examining whether people with BPD features are more emotionally reactive than low-BPD controls in response to negative events by requiring all participants to experience the same, well-controlled, stressful event.

Findings indicated that the new social rejection stressor was generally believable and feasible. With any false feedback paradigm, one important issue has to do with whether the participants believe the false feedback. Although the findings suggested that over 50% of participants believed the feedback, the believability appeared to be modest, perhaps due to the nature of the measure of believability. Asking a direct question about belief likely prompted suspiciousness, which may have influenced the results. Little previous research using false-feedback paradigms explicitly reports results for believability. Therefore, it is difficult to determine whether the belief ratings in this study are consistent with those of other procedures.

Unexpectedly, the participants rated the academic failure condition as more believable than the social rejection condition. It is unclear exactly why this difference occurred. Comments from participants indicated that some thought the feedback was "too harsh" and therefore not believable. It seems as though participants had a hard time believing another person could be so mean, based on so little information. Additionally, the majority of participants in this study were first year university undergraduate students. As such, it may be possible that many students were more familiar with receiving negative feedback on written assignments, and therefore found the academic failure condition more consistent with their experiences.

Despite these condition differences, the lack of group differences in believability and the lack of an association between believability and measures of emotional responding suggest that believability did not account for the primary

findings of this study. Furthermore, the development and testing of this new procedure was one of the aims of this study, and therefore offers a unique addition to the field by providing future researchers with a new tool to use when examining these phenomena. Emotion inductions involving failure experiences and social evaluation have been demonstrated to be among the most effective procedures developed (Nummenmaa & Niemi, 2004; Westermann, Spies, Stahl, & Hesse, 1996). Furthermore, these procedures parallel real-life experiences, and therefore have strong ecological validity. Interpersonal difficulties and fear of rejection or abandonment are hallmark characteristics of BPD, and a growing body of evidence suggests interpersonal events may have a strong association with the maladaptive behaviours in which people with BPD engage (e.g., Brown, 2003; Stiglmayr et al., 2005). Furthermore, conditions involving social evaluation have been demonstrated to lead to strong feelings of shame (Grunewald et al., 2004), which may be an emotion of particular importance for persons with BPD (Rusch et al., 2007), particularly given the findings of this study. Future research will continue to develop and improve these techniques to maximize believability and minimize its influence on measures of emotional state.

Contrary to hypotheses, findings indicated that the high-BPD participants did not display greater overall negative emotional reactivity to the laboratory stressors. The findings, however, suggested the importance of controlling for dissociation in examinations of emotional reactivity in BPD. After controlling for dissociation, the high-BPD group did show greater emotional reactivity. As such, this research provides further clarification as to why some studies that did not

measure dissociative symptoms have not found evidence of heightened emotional reactivity among persons with BPD features (e.g., Herpertz, et al., 2000; Herpertz, Kunert, Schwenger, & Sass, 1999). An accumulation of evidence (e.g., Bijttebier & Vertommen, 1999; Kruedelbach, McCormick, Schulz, & Grueneich, 1993) suggests that persons with BPD demonstrate a propensity towards *experiential avoidance* – behaviours that function to help an individual avoid or escape from unwanted thoughts, feelings, sensations, or other internal experiences (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Dissociation can be conceptualized as an extreme form of experiential avoidance which allows the individual to temporarily disengage from their unwanted internal experiences, as well as those situations which elicit them. Given that persons with BPD features are especially prone to these avoidant coping behaviours, the findings of the present study underscore the importance of measuring dissociation in future research on emotions in BPD.

The findings also suggest that emotional reactivity among persons with BPD features depends on the type of stressor and the type of emotional response. In terms of emotional response type, BPD features may be particularly associated with heightened shame and anger reactivity to interpersonal stressors. The current research is one of the first studies in this area to explore emotion-specific responses, rather than relying solely on aggregate categories such as *negative emotions*. By examining specificity of emotions, this study builds on extant research and represents a crucial next step for the field.

My emotion-specific hypotheses were partially supported in this study. As predicted, participants who were high in BPD features evidenced greater overall levels of both shame and anger, compared to low-BPD participants. High-BPD participants also demonstrated greater increases in shame following the emotion induction procedures than low-BPD participants. This was not the case for other emotions, such as guilt, anxiety, and distress. As such, the current study provides some of the first evidence that persons with BPD features may not display heightened reactivity across all negative emotions but may struggle with a few particular emotions, such as shame.

Additionally, this study provides evidence that BPD characteristics may have a unique pattern of relationships with both types of stressors and specific emotions. For example, high-BPD participants only demonstrated heightened anger reactivity in the social rejection condition. Furthermore, social rejection resulted in a greater increase in anger among the high-BPD participants than the academic failure condition, but low-BPD participants were equally angry after either emotion induction. Therefore, specific types of stressors may be more likely to elicit specific emotions, and these relationships may be unique among persons with BPD features.

Although both stressors in this study can be considered interpersonal, there were important differences between the failure feedback and social rejection feedback conditions. For instance, the social rejection condition is considerably more relevant to evaluations of the self, rather than a particular action (writing an essay). As hypothesized, participants who were high in BPD

features demonstrated greater emotional reactivity in response to the more interpersonally relevant stressor, compared to low-BPD participants. This greater emotional reactivity was not apparent in the academic failure condition, where high-BPD participants demonstrated no greater increase in negative emotions than low-BPD participants. As such, these findings demonstrated that the type of stressor, or emotional context, must be considered in order to fully understand emotional responding among persons with BPD features.

The result that persons with BPD features were more emotionally reactive to social rejection, compared to failure, is consistent with both theory and research that indicates interpersonal relationships are particularly important and problematic for persons with BPD (APA, 2000; Morey, Gunderson, & Quigley, 2002; Skodol et al., 2002). Social rejection can be seen as a form of abandonment, which is a core fear among persons with BPD and "related to an intolerance of being alone and a need to have other people with them" (APA, 2000, p 706). Moreover, persons with BPD have deficits in the ability to solve interpersonal problems (Berk, Jeglic, Brown, Henriques, & Beck, 2007; Ziegler-Hill & Abraham, 2006) and are more likely to report events of an interpersonal nature as precipitating suicide attempts than persons with major depressive disorder (Brodsky, Groves, Oquendo, Mann, & Stanley, 2006).

Limitations and Future Directions

Some study limitations warrant consideration. Although there are distinct advantages to studying individuals across the BPD spectrum, this research utilized undergraduate students rather than a clinical sample. Participants were

chosen for this study due to elevated scores on a questionnaire measure, rather than through a full diagnostic interview. As such, the results may not be directly generalizable to a clinical sample. Furthermore, this study only examined participants at either end of the PAI-BOR spectrum. Additionally, this research did not contain a clinical control group. Without such a group, there can be less certainty that group differences are due to BPD specifically, rather than psychopathology more generally. The findings, however, suggested that there was no significant association of general psychopathology with reactivity to the emotional stressors.

Along similar lines, another limitation is the small sample size used in this study. Although effect sizes for the emotion inductions were large, and power appears to have been adequate to detect group differences, a larger sample would provide greater confidence in these results. In particular, data on the BSI and DSS were unavailable for 17 participants, which may have reduced power for analyses involving those measures. Furthermore, the very small sample of males in this study precludes examining gender as a possible moderator of these effects - a common difficulty among studies on BPD. In an attempt to address this limitation, I conducted my primary analyses using only females (n=53) and the pattern of findings was the same as it was for the full sample.

Additionally, although participants were randomly assigned to conditions evenly, differential cancellations and no-shows resulted in uneven numbers of participants in each condition. Equivalent numbers of participants per cell would have allowed for greater precision in analyses and greater confidence in the

results. This also led to another limitation, which is that random assignment did not result in equal baseline mood between conditions. Although it is unclear as to why, high-BPD individuals assigned to the academic condition were in a slightly more negative emotional state before the emotion induction, compared to high-BPD participants assigned to the social rejection condition. It is likely that a larger sample size with more even distribution of participants to cells would eliminate this fluke baseline issue.

Another limitation common to most research in the area is the reliance on self-report measures. Future research would be strengthened by the inclusion of techniques to measure other aspects of the emotional response, such as cardiac measures and physiological arousal. Furthermore, this study did not include a measure of social desirability or impression management, which allows for the possibility that the self-report measures may be influenced by these response biases. Additionally, it is possible that the 5-point likert scale on the PANAS is not sensitive enough to measure moment by moment changes in emotional state, and does not provide a wide enough response range to allow for demonstrations of higher negative baseline emotional state as well as greater increases in negative emotions. In this study, there was no evidence of a ceiling effect, however, as most participants clustered at the lower end of the 5-point scale, as opposed to the upper end. Few participants reported emotions across the full range of responses; therefore, it is unlikely that the PANAS artificially restricted evidence of reactivity among high-BPD participants.

Although the emotion induction procedures are specifically tailored to these research questions and are a strength of this study, the social rejection paradigm has never been used before in published research. Therefore, this procedure has not been empirically validated for use with either an undergraduate or BPD population. This also makes it difficult to directly compare results with those published in other research, as I did not use the same emotion inductions. Although believability surpassed the threshold for acceptability in this study, one limitation is that a substantial proportion of participants reported they did not believe the false-feedback. Furthermore, the method used to assess believability was rather unsophisticated and may have prompted suspiciousness among participants. Nonetheless, this study represents an interesting first step in the development of an interpersonal laboratory stressor. Future research should continue to examine and improve this procedure.

Implications

This research further underscores the importance of examining emotional responding using a standardized laboratory stressor that resembles the real-life stressful situations that lead to emotional difficulties among persons with BPD features. Furthermore, the development of these procedures is the first step towards answering the question of whether social rejection and failure are critical experiences that lead to distress among people with BPD. Given that social rejection was associated with emotional reactivity among persons with BPD, these procedures will allow future research to address important questions about factors related to the serious problematic behaviours in which persons with BPD

engage. For example, do the ways in which people with BPD cognitively appraise experiences of social rejection influence their emotional responses? Are people with BPD more likely to utilize different, perhaps even less adaptive, strategies to regulate emotions following the experiences of rejection compared with other stressful experiences? Are interpersonal stressors, particularly those that involve negative evaluation of the self, so troubling for people with BPD due to their marked identity disturbances? Having an ecologically valid laboratory procedure that captures the real world interpersonal difficulties faced by persons with BPD is an important first step toward developing methods to help them not rely on maladaptive behaviours, but rather cope with such stressors more effectively. Furthermore, by examining the specific relationships among BPD features, types of stressors, and discrete emotions, this project may help to chart a new course for research on how to better understand BPD and to help alleviate the suffering of people with this disorder.

APPENDICES

Appendix A: Failure Induction Materials

Academic Failure Induction – Essay Writing Form

In this study we are interested in people's use of feedback. Therefore you will be interacting with another participant throughout this study and completing tasks that will allow you to give and receive feedback from each other. After the experiment you may have the opportunity to meet the other participant.

Write a short, one-page essay on abortion. You are free to take whatever stance you prefer (either pro-life or pro-choice), but please indicate the side you are arguing. This essay will be given to your partner for feedback.

This essay is
Pro-Life OR Pro-Choice (Please circle one)

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Academic Failure Induction – Pro-Choice Essay by Fictitious Other Participant (handwritten)

This essay is

Pro-Life OR | Pro-Choice | (Please circle one)

In society today, there are few issues so hotly and passionately debated as whether or not abortion should remain legal. Those who advocate against abortion argue that the fetus is a human being and killing a human being is wrong, therefore abortion is also wrong. Those against abortion also seem to argue that the woman made a choice to get pregnant, therefore she should have to deal with the consequences. What if the fetus was the result of a rape? Should a woman be forced to carry such a child to term, being reminded of her traumatic experience each and every day? There are many different circumstances under which abortion is an understandable and justifiable decision and women should be supported for making that decision. Multitudes of conservative people in our society have proliferated endless propaganda that legalized abortion is bad and that it must be stopped at all costs. This extreme view comes from people who argue foolishly that the life of an unborn fetus is more important than the life of the woman carrying it. They fail to see that there are benefits to legalized abortion, such as women having the option of a safe, medically sound abortion in a clean, comfortable environment which minimizes risk to their own lives. Gone are the days of dangerous back-alley procedures where shady individuals lacking any qualifications charge exorbitant fees and ultimately may risk the future reproductive health or life of the women seeking their services. Prohibiting abortion will not prevent unwanted pregnancies, nor will it prevent abortion from happening. Taking away the option of choice simply turns the women into a victim. Is this really fair?

Academic Failure Induction – Pro-Life Essay by Fictitious Other Participant (handwritten)

This essay is

Pro-Life

OR Pro-Choice (Please circle one)

In society today, there are few issues so hotly and passionately debated as whether or not abortion should remain legal. Those who advocate for a woman's right to choose argue that the fetus is part of a woman's body and therefore what happens to it should be completely at her discretion. Multitudes of people in our society have come to believe endless propaganda that legalized abortion is good and that it must be protected at all costs because there are benefits to having such options available. This extreme view comes from people who argue foolishly that women should be free to choose. They fail to see that if a choice needs to be made, it should be made before the conception of a child. After conception, it is too late for such decisions. At conception a <u>child</u>, not merely a piece of tissue but a real little <u>person</u>, has been created. One of the most important principles of our "civilized" society is that one person should not kill another person. It is never acceptable in other contexts to argue that taking the life of another human being is justified because it is more "convenient" for someone. Why it is okay in the case of abortion? Abortion is murder; plain and simple. More specifically, abortion is the practice of murdering those most defenceless among the human race – unborn children. Unfortunately, such a horrific practice has become common place and accepted in our culture today. People need to realize there is no real difference between killing a child before or after it is born – either way it is murder and it is wrong.

Academic Failure Induction – Essay Feedback Form

You have just read an essay written by another participant whom you have been paired with in this study. Please reflect on this essay and complete the following evaluation as honestly as possible.

On a scale of 1-10, with **1 representing the worst possible** and **10 representing the best possible**, please rate the essay you read on each of the following components:

Organization   _____

Originality   _____

Writing Style   _____

Clarity of Expression   _____

Persuasiveness of Argument   _____

Overall Quality   _____

Comments (optional):

_____

_____

_____

_____

_____

Academic Failure Induction – Essay Feedback from Fictitious Other Participant (handwritten)

You have just read an essay written by another participant whom you have been paired with in this study. Please reflect on this essay and complete the following evaluation as honestly as possible.

On a scale of 1-10, with **1 representing the worst possible** and **10 representing the best possible**, please rate the essay you read on each of the following components:

Organization   __3__

Originality   __2_

Writing Style   __2__

Clarity of Expression   __3__

Persuasiveness of Argument   __3__

Overall Quality   __3__

Comments (optional):

This is one of the worst essays I have ever read!

_____

_____

_____

Appendix B: Rejection Induction Materials

Social Rejection Induction – Personal Profile Form

In this study we are interested in people's first impressions. Therefore, you will be interacting with another participant throughout this study and completing tasks that will allow you to form an impression of each other. After the experiment you may have the opportunity to meet the other participant.

Write a short paragraph answering each of the following questions. This information will be given to your partner so they can get to know you.

1) What are your hobbies?

_____

_____

2) What is your favourite Movie? Why?

_____

_____

3) What is your favourite book? Why?

_____

_____

4) Who is the person you admire most? Why?

_____

_____

_____

5) If you were left alone on a desert island, what would you take with you?

_____

_____

6) If there were only 10 minutes left until the end of the world, what would you do?

_____

_____

7) The 5 words that describe you best are:

_____

_____

Social Rejection Induction – Personal Profile of a Female Fictitious Participant (handwritten)

1) What are your hobbies?

I don't have a lot of time for hobbies! In the spare time that I do have I love watching/playing sports, cooking, relaxing, daydreaming, swimrning, traveling, hiking, and shoe shopping. I LOVE SHOES! I'm always up for doing new things.

2) What is your favourite Movie? Why?

Oh so many! SUPERSTAR! Snatch, Half baked, Fear and Loathing, Bowling for Columbine, Kill Bill, Afterlife, Once Upon a Time in China, Time and Tide, Braveheart, Coyote Ugly, I Am Sam, and How to Lose a Guy in 10 Days!

3) What is your favourite book? Why?

People still read books these days? Like not for school? Crazy! Just kidding. Harry Potter, A Boy Called It, Catcher in the Rye, Gone with the Wind, Old classics, A Clockwork Orange, cheesy mysteries and Harlequin romances. Oh and Simpson comics! ☺

4) Who is the person you admire most? Why?

My brother, no matter what he goes through in his life he always comes out of it on top. My best friend, she is just too cool. My mom, she had a rough life. And anyone with mega talent and passion.

5) If you were left alone on a desert island, what would you take with you?

Usually when you are stranded somewhere it's not planed, so all I would have is what's in my bag: notebook, keys, lipsmackers, and a couple slices of gum. However, I would pray that at the time I became stranded Brad Pitt was there!!!

6) If there were only 10 minutes left until the end of the world, what would you do?

Freak out cuz we're all gonna die in 10 minutes! Then I'd tell everyone I love how awesome they are and how much I love them, kiss as many cute boys as possible, then hug my best friends while eating all the desserts I can 'til we explode

7) The 5 words that describe you best are:

Sarcastic, caring, cheerful, naughty, friendly.

Social Rejection Induction – Personal Profile of a Male Fictitious Participant (handwritten)

1) What are your hobbies?

Riding dirt bikes, quads, mountain biking, playing guitar, playing with photoshop, "managing" my best friends' band, Basketball(coaching and playing), cars (rallying and auto-x), friends, University, and general chaos

2) What is your favourite Movie? Why?

Anything funny or offensive, Gattaca, Eyes wide shut, Lolita, Pay it Forward, Fallen, the Evil Dead trilogy, American History X, Fight Club, Full Metal Jacket

3) What is your favourite book? Why?

Earth Abides, Rising Sun, Chrysalides, Brave New World, Lord of the Rings

4) Who is the person you admire most? Why?

You…if you're superman. If not, then it's superman.
Seriously though, without a doubt my father is a person I really admire, for so many reasons.

5) If you were left alone on a desert island, what would you take with you?

Usually when you become stranded somewhere, you're not given a choice of what to bring. However, I would bring a b-ball hoop, a b-ball, a blanket and a girl. Then do everything I could NOT to be found.

6) If there were only 10 minutes left until the end of the world, what would you do?

Go out with a bang! Sacrifice myself to save the world, or eat some ice cream, which ever is easier.

7) The 5 words that describe you best are:

Funny, athletic, mysterious, intelligent, sarcastic.

Social Rejection Induction – Profile Feedback Form

You have just read the personal profile of another participant you have been paired with in this study. Please reflect on this information and answer the following questions as honestly as possible.

1) Does this sound like the kind of person you would want to be friends with?

_____

_____

_____

2) Do you think this would be a fun person to be around?

_____

_____

_____

_____

3) Did you find this person unique, creative and/or interesting?

_____

_____

_____

_____

4) After reading the profile information, would you want to get to know this person better?

_____

_____

_____

5) Would you like an opportunity to meet this person after the study session today?

_____

_____

Social Rejection Induction – Profile Feedback from the Fictitious Other Participant (handwritten)

1) Does this sound like the kind of person you would want to be friends with?

Not so much. My friends are cooler.

2) Do you think this would be a fun person to be around?

I really don't think so. HE/She doesn't seem to have much personality. HE/She sounds kind of dull and average.

3) Did you find this person unique, creative and/or interesting?

Not really. Nothing HE/she said was interesting or particularly unique.

4) After reading the profile information, would you want to get to know this person better?

Probably not. I don't think we'd click.

5) Would you like an opportunity to meet this person after the study session today?

I really have no desire to meet this person. Waste of my time. I'd rather do the task again.

Appendix C: Follow-Up and Belief Questions

Follow-Up Questions

SIMON FRASER UNIVERSITY
DEPARTMENT OF PSYCHOLOGY

FOLLOW-UP QUESTIONAIRE

INSTRUCTIONS: This questionnaire asks you about your experiences during this last task. Please circle your answer for each of the questions below.

Did the feedback in the previous writing task make you upset?	Very much so	Moderately	Not at all
Did the feedback in the previous writing task hurt your feelings?	Very much so	Moderately	Not at all
Do you feel angry at the other participant in the previous writing task?	Very much so	Moderately	Not at all
Did you believe that the feedback you were given from the other participant was real?	Yes	No	
Do you believe the feedback came from another participant in this study?	Yes	No	
Would you be willing to participate in this same study again at a later date?	Yes	No	

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